EMX-945GSE Series

Intel® 945GSE Supports Intel® FCBGA8 45nm Atom™ N270 Processor Mini ITX Main Board

User's Manual

1st Ed – 17 March 2009

FCC Statement

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTATLLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

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To receive the latest version of the user's manual; please visit our Web site at:
http://www.avalue.com.tw/

If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Avalue's products. In fact, most problems reported are minor and are able to be easily solved over the phone.
In addition, free technical support is available from Avalue's engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products. Please do not hesitate to call or e-mail us.

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Avalue warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Avalue, or which have been subject to misuse, abuse, accident or improper installation. Avalue assumes no liability under the terms of this warranty as a consequence of such events. Because of Avalue's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If any of Avalue's products is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details. If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU type and speed, Avalue's products model name, hardware & BIOS revision number, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.
4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

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Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If his equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This class B digital apparatus complies with Canadian ICES-003.

Safety information

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area.
- If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

The symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

About this guide

This user guide contains the information you need when installing and configuring the motherboard.

How this guide is organized

This manual contains the following parts:

- **Chapter 1: Product introduction**

  This chapter describes the features of the motherboard and the new technology it supports. This chapter also lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

- **Chapter 2: BIOS setup**

  This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. Avalue websites

The Avalue website provides updated information on Avalue hardware and software products. Refer to the Avalue contact information.

2. Optional documentation

Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

Conventions used in this guide

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

DANGER/WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and additional information to help you complete a task.

Typography

Bold text	Indicates a menu or an item to select
Italics	Used to emphasize a word or a phrase
<Key>	Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key Example: <Enter> means that you must press the Enter or Return key
<Key1>+<Key2>+<Key3>	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+) Example: <Ctrl>+<Alt>+<D>
Command	Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets Example: At the DOS prompt, type the command line: **afudos /i[filename]** **afudos /iP5P800VM.ROM**

EMX-945GSE specifications summary

Specifications

System

CPU	Supports Intel® FCBGA8 45nm Atom™ N270 Processor
FSB	533 MHz
BIOS	Award 4MB (Mega Byte) SPI BIOS
System Chipset	Intel® 945GSE + ICH7-M Chipset
I/O Chipset	Winbond W83627DHG-A
Memory	One 200-pin SO-DIMMs up to 2GB single Channel DDR2 533 SDRAM , non-ECC
SSD	One CompactFlash Type I/II socket
Watchdog Timer	Reset: 1 sec.~255 min. and 1 sec. or 1 min./step
H/W Status Monitor	Monitoring CPU temperature, voltage, and cooling fan status. Auto throttling control when CPU overheats
Expansion Slots	1 x PCI (PCI Rev. 2.3 compliant) supports 3 PCI master
DIO	8-bit General Purpose I/O for DI and DO
S3/S4	Yes
TPM	TPM1.2 (Infineon® TPM chip 9635 TT 1.2 on board)LAN (PME / RPL)
Wake up on LAN or Ring	YES

Display

Chipset	Intel® 945GSE GMCH integrated Graphics Media Accelerator 950	
Display Memory	Intel® DVMT 3.0 supports 224 MB video memory	
Max Resolution	CRT mode :2048x1536@75Hz , LCD mode : 2048x1536@60Hz	
Dual Display	EMX-945GSE-A1R	CRT+LVDS
	EMX-945GSE-A1-DVIR	CRT+LVDS, CRT+DVI, DVI+LVDS
VGA	Yes , on board GMA 950,Support for CRT resolutions up to QXGA	
LVDS	Support for dual-channel LVDS resolutions up to UXGA	
	EMX-945GSE-A1R	Single/Dual channel 24bit LVDS
	EMX-945GSE-A1-DVIR	Single/Dual channel 18bit LVDS
LVDS Backlight power connector	Yes	

Networking

LAN1	Realtek RTL8111C Gigabit LAN
LAN2	Realtek RTL8111C Gigabit LAN

Audio

Audio Codec	Realtek® ALC888, 5.1 HD Audio
Audio Interface	Mic in, Line in, Line out

Audio Amplifier (W)	TPA3005D2 Stereo 6Watt

I/O Port	
Back Panel I/O Port	1 x DVI port (for EMX-945GSE-A1-DVIR only), 1 x PS/2 Keyboard, 1 x PS/2 Mouse, 1 x VGA port, 2 x COM Port, 2 x RJ45 port, 4 x USB 2.0/1.1, 1 x Audio Jack (3 ports)
Internal I/O	2 x Power COM port, 1 x 2x10-pin ATX power connector, 1 x CPU fan connector, 1 x Power fan connector, 1 x USB connectors support additional 2 USB ports, 1 x LVDS connector, 1 x LVDS inventor connector, 1 x IDE connector, 2 x SATA connectors, 1 x Digital IO header, 1 x Front panel header, 1 x S/PDIF Out header, 1 x Audio amplifier connector, 1 x Front audio connector, 1 x Mini-PCI Express
Mechanical & Environment	
Power Type	ATX mode
Operating Temp.	0 ~ 60℃ (32 ~ 140℉)
Operating Humidity	0%~90% relative humidity, non-condensing
Size (L x W)	170 mm x 170 mm

* Specifications are subject to change without notice.

This chapter describes the motherboard features and the new technologies it supports.

1 Product Introduction

1.1 Welcome!

Thank you for buying an ® EMX-945GSE motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of quality motherboards!

Before you start installing the motherboard, and hardware devices on it, check the items in your package with the list below.

1.2 Package contents

Check your motherboard package for the following items.

Before you begin installing your single board, please make sure that the following materials have been shipped:

- 1 x EMX-945GSE Mini ITX Main board
- 1 x CD-ROM contains the followings:
  - User's Manual in PDF file
  - Drivers
- 1 x IDE cable (40-pin)
- 2 x SATA cable kit (SATA and Power)
- 1 x I/O Shield

If any of the above items is damaged or missing, contact your retailer.

1.3 Special features

1.3.1 Product highlights

The Latest Processor Technology

The Intel® Atom™ processor is Intel's smallest processor, built with the world's smallest transistors and manufactured on Intel's industry-leading 45nm Hi-k Metal Gate technology. The Intel Atom processor was purpose-built for simple, affordable, netbooks and nettops.

Intel® Atom™ N270 Processor

The Intel® Atom™ processor N270, implemented in 45nm technology, is power-optimized and delivers robust performance-per-watt for cost-effective embedded solutions. Featuring extended lifecycle support, this processor offers an excellent solution for embedded market segments such as digital signage, interactive clients (kiosks, point-of-sale terminals), thin clients, digital security, residential gateways, print imaging, and commercial and industrial control. The processor remains software compatible with previous 32-bit Intel® architecture and complementary silicon.

Intel® 945GSE Chipset

The mobile Intel® 945GSE Express Chipset provides power-efficient graphics and rich I/O capabilities for cost-effective embedded solutions. It features an integrated 32-bit 3D graphics engine based on Intel® Graphics Media Accelerator 950 (Intel® GMA 950) architecture, a 533 MHz front-side bus (FSB), single-channel 400/533 MHz DDR2 system memory (SODIMM and/or memory down), and Intel® High Definition Audio[1] interface.
The chipset consists of the Intel® 82945GSE Graphics Memory Controller Hub (GMCH) and Intel® I/O Controller Hub 7-M (ICH7-M). It delivers outstanding system performance and flexibility through high-bandwidth interfaces such as PCI Express,* PCI, Serial ATA, and Hi-Speed USB 2.0 connectivity.

DDR2 memory support

The motherboard supports DDR2 memory which features data transfer rates of 1066/800/533 MHz to meet the higher bandwidth requirements of the latest 3D graphics, multimedia, and Internet applications. The dual-channel DDR2 architecture doubles the bandwidth of your system memory to boost system performance, eliminating bottlenecks with peak bandwidths of up to 8.5 GB/s.

PCI Express™ interface

The motherboard fully supports PCI Express, the latest I/O interconnect technology that speeds up the PCI bus. PCI Express features point-to-point serial interconnections between devices and allows higher clockspeeds by carrying data in packets. This high

speed interface is software compatible with existing PCI specifications. See page 1-22 for details.

Serial ATA technology

The motherboard supports the Serial ATA technology through the Serial ATA interfaces and the Intel® ICH7 chipset. The SATA specification allows for thinner, more flexible cables with lower pin count, reduced voltage requirement, and up to 300 MB/s data transfer rate.

S/PDIF digital sound ready

The motherboard supports the S/PDIF Out function through the S/PDIF interfaces at mainboard. The S/PDIF technology turns your computer into a high-end entertainment system with digital connectivity to powerful audio and speaker systems. See page 1-31 for details.

Temperature, fan, and voltage monitoring

The CPU temperature is monitored by the ASIC (integrated in the Winbond Super I/O) to prevent overheating and damage. The system fan rotations per minute (RPM) is monitored for timely failure detection. The ASIC monitors the voltage levels to ensure stable supply of current for critical components.

1.4 Before you proceed

Take note of the following precautions before you install motherboard components or change any motherboard settings.

- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- **Before you install or remove any component, ensure that the ATX power supply is switched off or the power cord is detached from the power supply.** Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

1.5 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

Make sure to unplug the power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components.

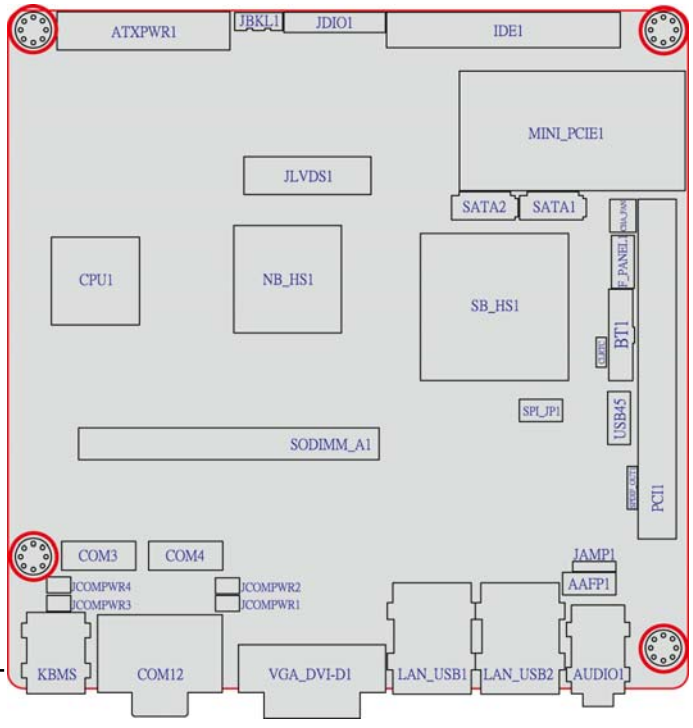
1.5.1 Placement Direction

When installing the motherboard, make sure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

1.5.2 Screw Holes

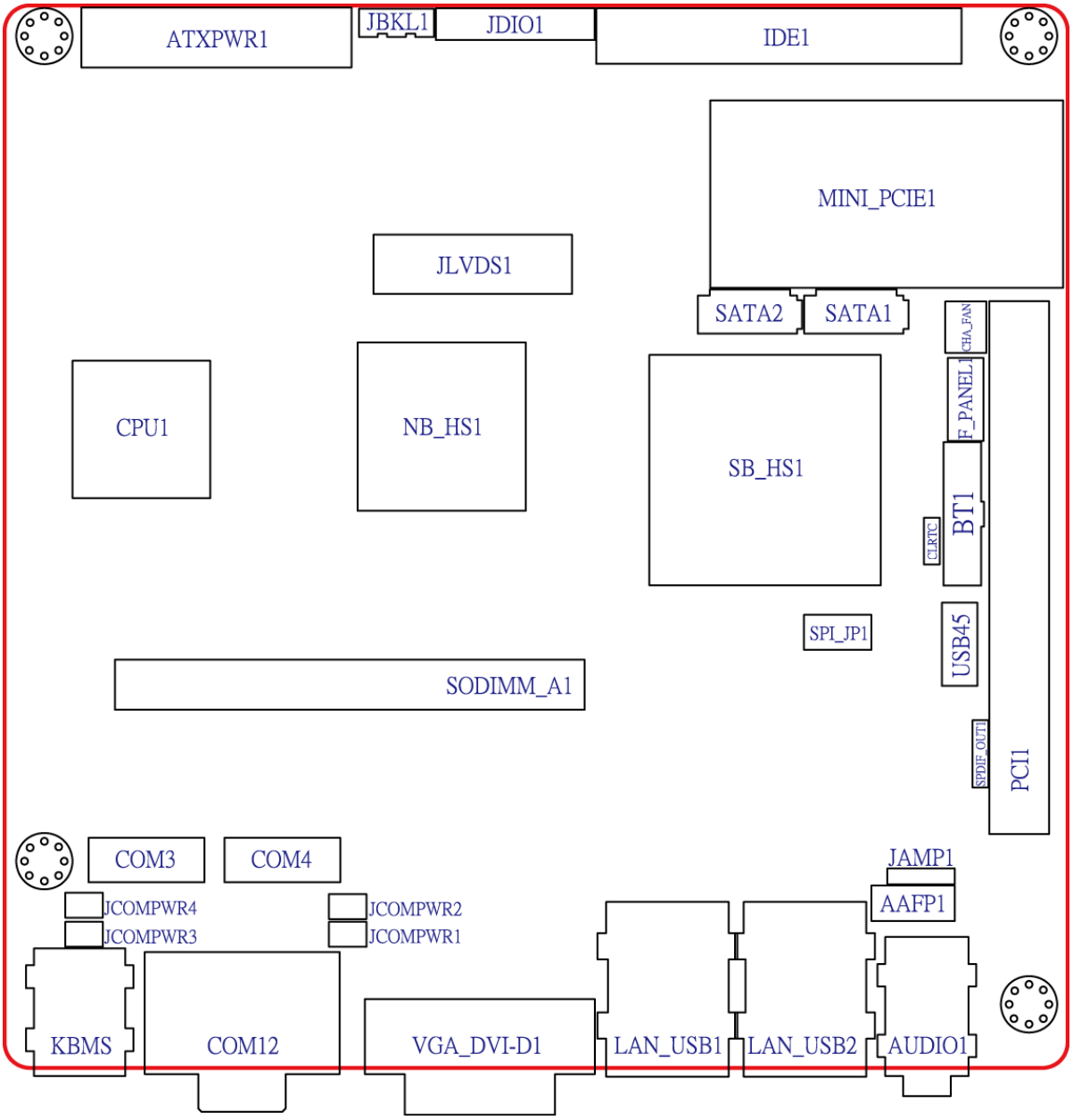
Place four (4) screws into the holes indicated by circles to secure the motherboard to the chassis.

Place this side towards the rear of the chassis

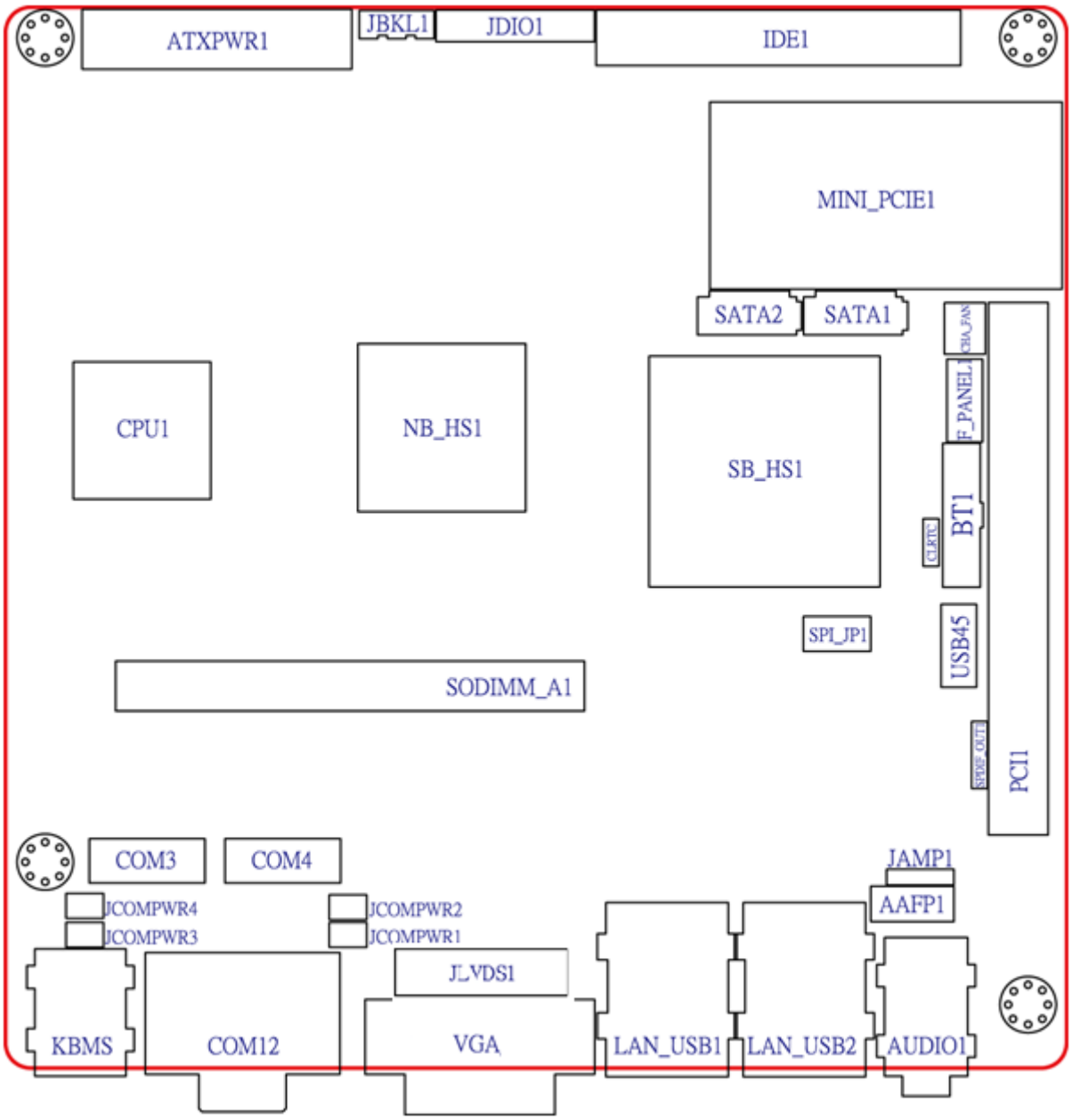


1.5.3 Motherboard Layout

- **For EMX-945GSE-A1-DVIR : with VGA+DVI connector**



- **For EMX-945GSE-A1R : with VGA connector only**

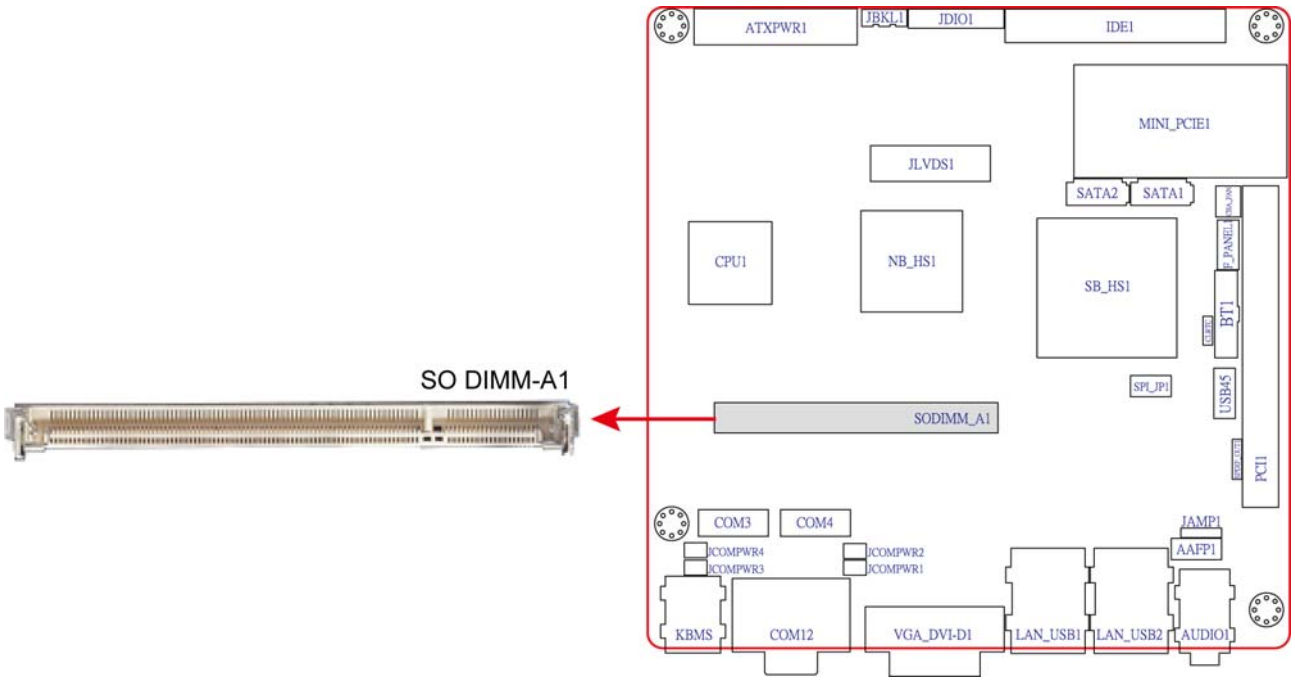


1.6 System memory

1.6.1 Overview

The motherboard comes with one 200-pin Double Data Rate 2 (DDR2) Small Outline Dual Inline Memory Modules (SO-DIMM) sockets.

A DDR2 module has the same physical dimensions as a DDR DIMM but has a 200-pin footprint compared to the 184-pin DDR DIMM. DDR2 DIMMs are notched differently to prevent installation on a DDR DIMM socket. The following figure illustrates the location of the sockets:



200-Pin DDR2 SO-DIMM sockets

Channel	Socket
Channel A	SO DIMM_A1

1.6.2 Memory Configurations

You may install 64 MB, 128 MB, 256 MB, 512 MB and up to 2 GB unbuffered ECC or non-ECC DDR SO-DIMMs into the SO-DIMM sockets using the memory configurations in this section.

1.6.3 Installing a DIMM

Make sure to unplug the power supply before adding or removing SO-DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Unlock a SO-DIMM socket by pressing the retaining clips outward
2. Align a SO-DIMM on the socket such that the notch on the SO-DIMM matches the break on the socket.
3. Firmly insert the SO-DIMM into the socket until the retaining clips snap back in place and the SO-DIMM is properly seated.

- A DDR2 SO-DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a SO-DIMM into a socket to avoid damaging the SO-DIMM.
- The DDR2 SO-DIMM sockets do not support DDR SO-DIMMs. DO NOT install DDR SO-DIMMs to the DDR2 SO-DIMM socket.

1.6.4 Removing a SO-DIMM

1. Simultaneously press the retaining clips outward to unlock the SO-DIMM.

Support the SO-DIMM lightly with your fingers when pressing the retaining clips. The SO-DIMM might get damaged when it flips out with extra force.

2. Remove the SO-DIMM from the socket.

1.7 Expansion slots

In the future, you may need to install expansion cards. The following sub-sections describe the slots and the expansion cards that they support.

Make sure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

1.7.1 Installing an Expansion Card

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.

2. Remove the system unit cover (if your motherboard is already installed in a chassis).
3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.
4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.
5. Secure the card to the chassis with the screw you removed earlier.
6. Replace the system cover.

1.7.2 Configuring an Expansion Card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 2 for information on BIOS setup.
2. Assign an IRQ to the card if needed. Refer to the tables on the next page.
3. Install the software drivers for the expansion card.

1.7.3 PCI slots

The PCI slots support cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications. The figure shows the type of LAN card that can be installed on a PCI slot.

1.8 Jumpers

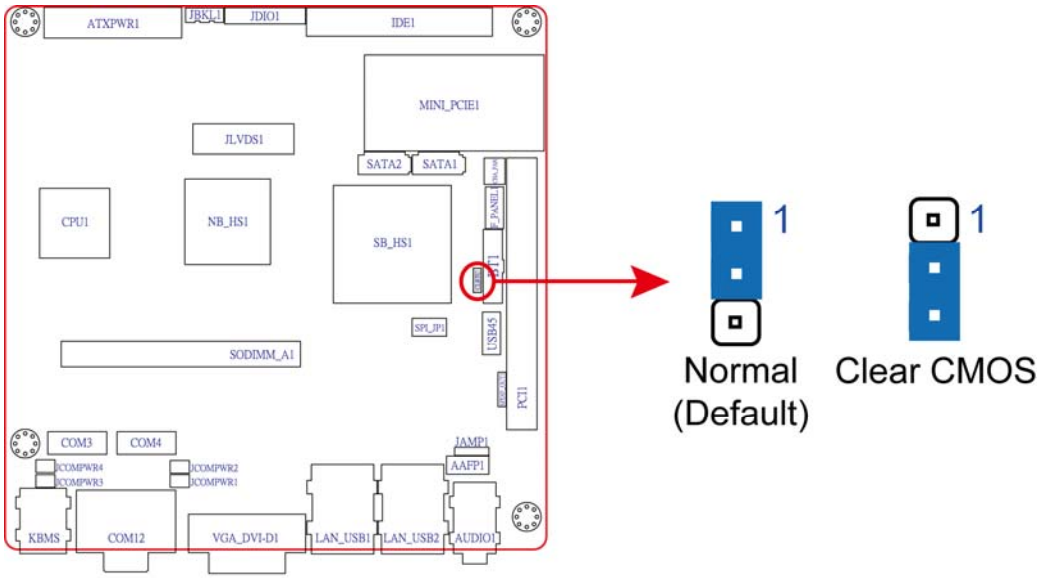
1. Clear RTC RAM (CLRTC)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!

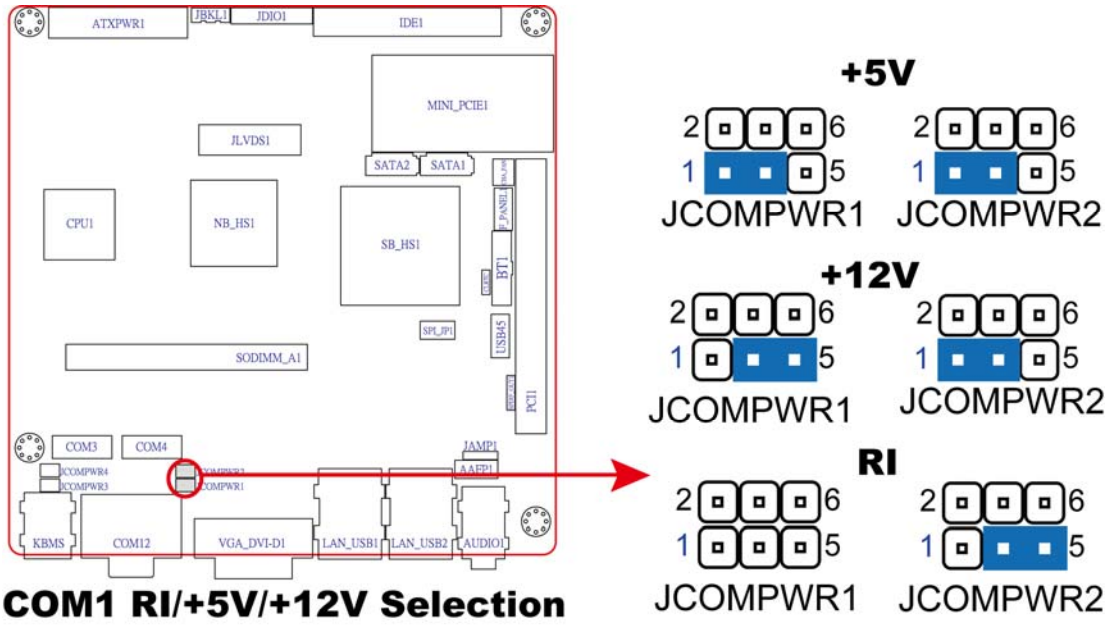


Clear RTC RAM

You do not need to clear the RTC when the system hangs due to overclocking. For system failure due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system so the BIOS can automatically reset parameter settings to default values.

2. COM1 RI, +12V and +5V Power Select (JCOMPWR1, JCOMPWR2)

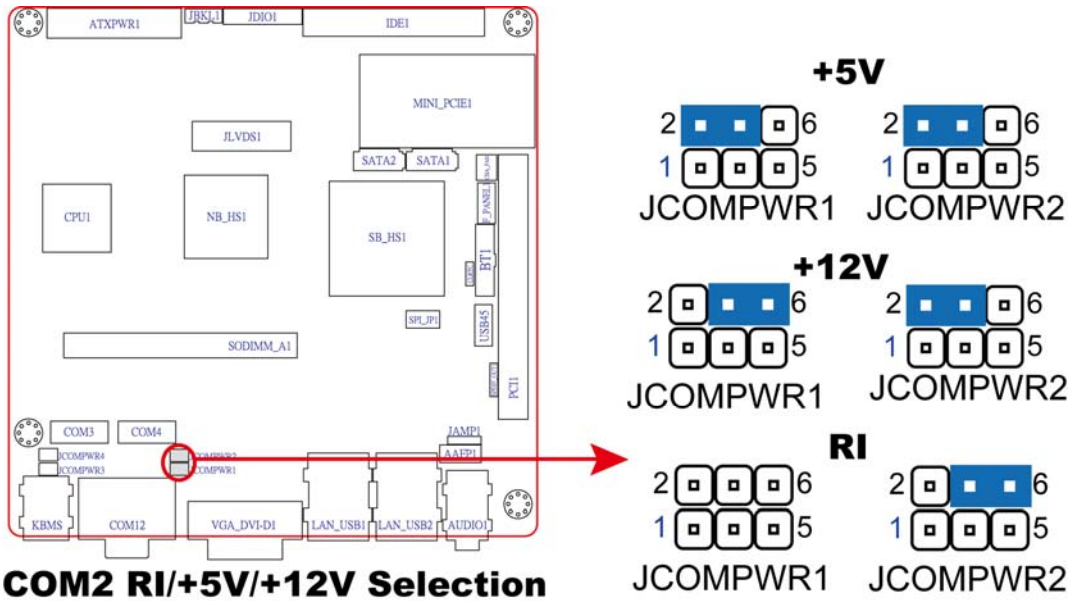
This jumper allows you to select COM1 RI, +5V and +12V power. Set JCOMPWR1 to pins 1-3 and JCOMPWR2 to pins 1-3 to select +5V power. And set JCOMPWR1 to pins 3-5 and JCOMPWR2 to pins 1-3 to select +12V power. Then set JCOMPWR2 to pins 3-5 and JCOMPWR1 to open for RI selection.



COM1 RI/+5V/+12V Selection

3. COM2 RI, +12V and +5V Power Select (JCOMPWR1, JCOMPWR2)

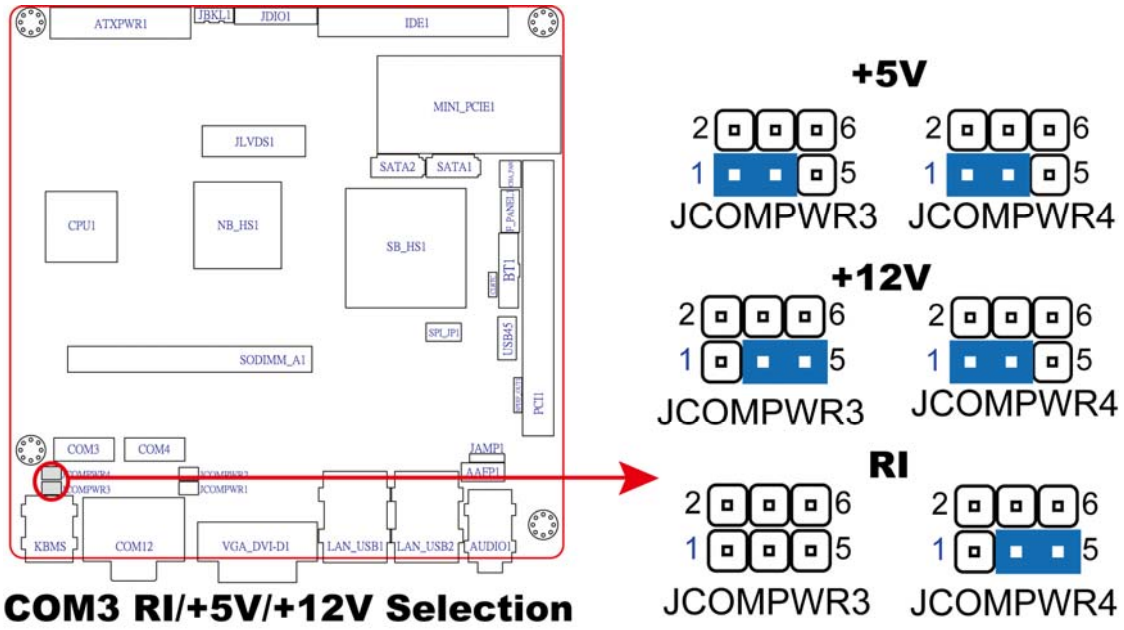
This jumper allows you to select COM2 RI, +5V and +12V power. Set JCOMPWR1 to pins 2-4 and JCOMPWR2 to pins 2-4 to select +5V power. And set JCOMPWR1 to pins 4-6 and JCOMPWR2 to pins 2-4 to select +12V power. Then set JCOMPWR2 to pins 4-6 and JCOMPWR1 to open for RI selection.



COM2 RI/+5V/+12V Selection

4. COM3 RI, +12V and +5V Power Select (JCOMPWR3, JCOMPWR4)

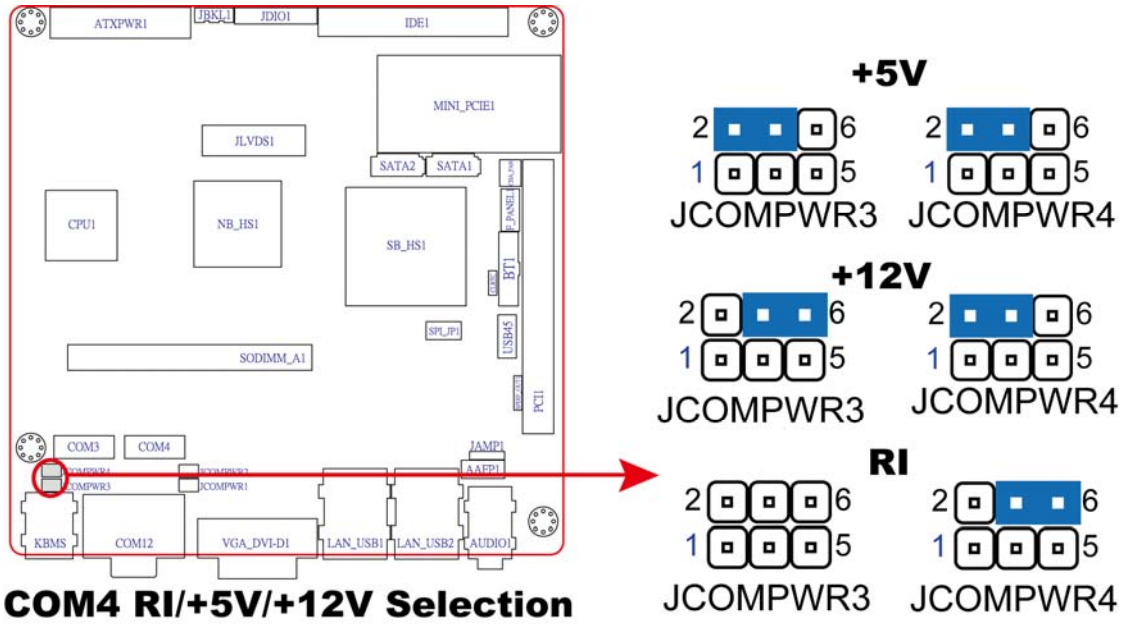
This jumper allows you to select COM3 RI, +5V and +12V power. Set JCOMPWR3 to pins 1-3 and JCOMPWR4 to pins 1-3 to select +5V power. And set JCOMPWR3 to pins 3-5 and JCOMPWR4 to pins 1-3 to select +12V power. Then set JCOMPWR4 to pins 3-5 and JCOMPWR3 to open for RI selection.



COM3 RI/+5V/+12V Selection

5. COM4 RI, +12V and +5V Power Select (JCOMPWR3, JCOMPWR4)

This jumper allows you to select COM3 RI, +5V and +12V power. Set JCOMPWR3 to pins 2-4 and JCOMPWR4 to pins 2-4 to select +5V power. And set JCOMPWR3 to pins 4-6 and JCOMPWR4 to pins 2-4 to select +12V power. Then set JCOMPWR4 to pins 4-6 and JCOMPWR3 to open for RI selection.



COM4 RI/+5V/+12V Selection

6. System Panel Connector (F_PANEL1)

This connector supports several chassis-mounted functions.

- System Power LED (2-pin PWRLED)

This 2-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- ATX Power Button/Soft-off Button (2-pin PWRSW)

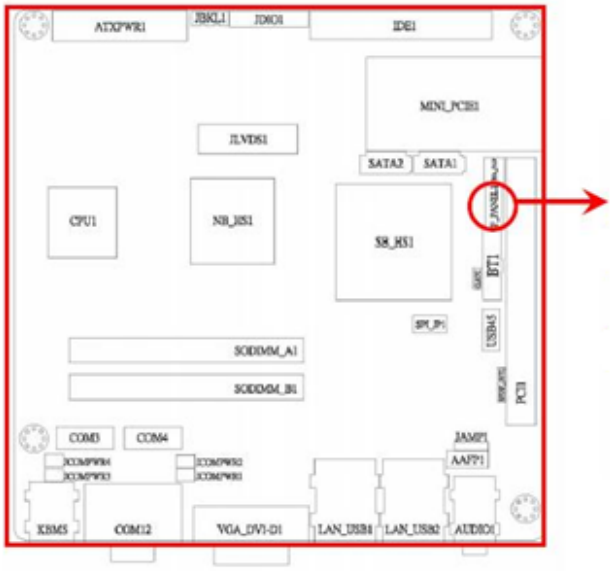
This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

- Hard Disk Drive Activity LED (2-pin HDLED)

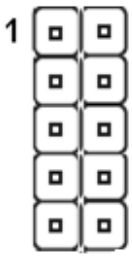
This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

- Reset Button (2-pin RESET)

This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

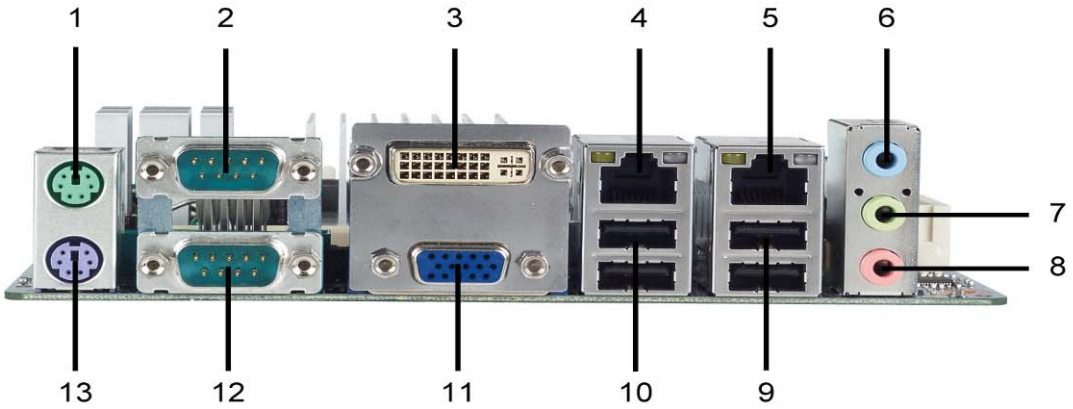


Signal	PIN	PIN	Signal
HD_LED+	1	2	PWR_LED+
HD_LED-	3	4	PWR_LED-
GND	5	6	PWR_SW
Reset	7	8	PWR_SW GND
NC	9		



1.9 Connectors

1.9.1 Rear panel connectors



1. PS/2 mouse port (green). This port is for a PS/2 mouse.

2. Serial connector. This 9-pin COM1 port is for serial devices.

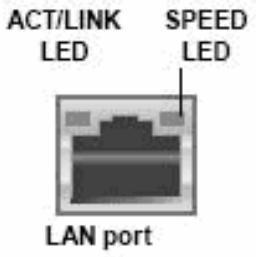
3. DVI connector—for EMX-945GSE-A1-DVIR only.

This 24-pin DVI port connects to a DVI monitor.

4 & 5. LAN (RJ-45) port. This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

LAN port LED indications

ACT/ LINK LED		SPEED LED	
Status	**Description**	**Status**	**Description**
OFF	No link	OFF	10Mbps connection
Orange	Linked	Orange	100Mbps connection
Blinking	Data activity	Green	1Gbps connection



6. Line In port (light blue). This port connects a tape, CD, DVD player, or other audio sources.

7. Line Out port (lime). This port connects a headphone or a speaker. In 4-channel, 6-channel, and 8-channel configuration, the function of this port becomes Front Speaker Out.

8. Microphone port (pink). This port connects a microphone.

9. USB 2.0 ports 3 and 4. These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

10. USB 2.0 ports 1 and 2. These two 4-pin Universal Serial Bus (USB) ports are available for connecting USB 2.0 devices.

11. VGA port. This 15-pin VGA port connects to a VGA monitor.

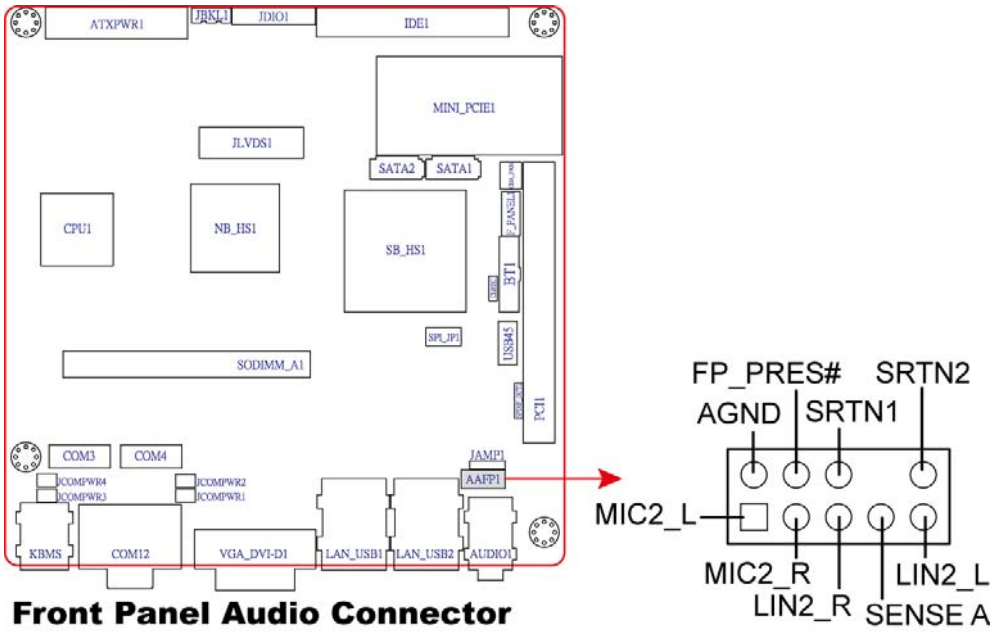
12. Serial connector. This 9-pin COM2 port is for serial devices.

13. PS/2 keyboard port (purple). This port is for a PS/2 keyboard.

1.9.2 Internal connectors

1. Front panel audio connector (10-pin AAFP1)

This connector is for a chassis-mounted front panel audio I/O module that supports either HD Audio or legacy AC'97 audio standard.

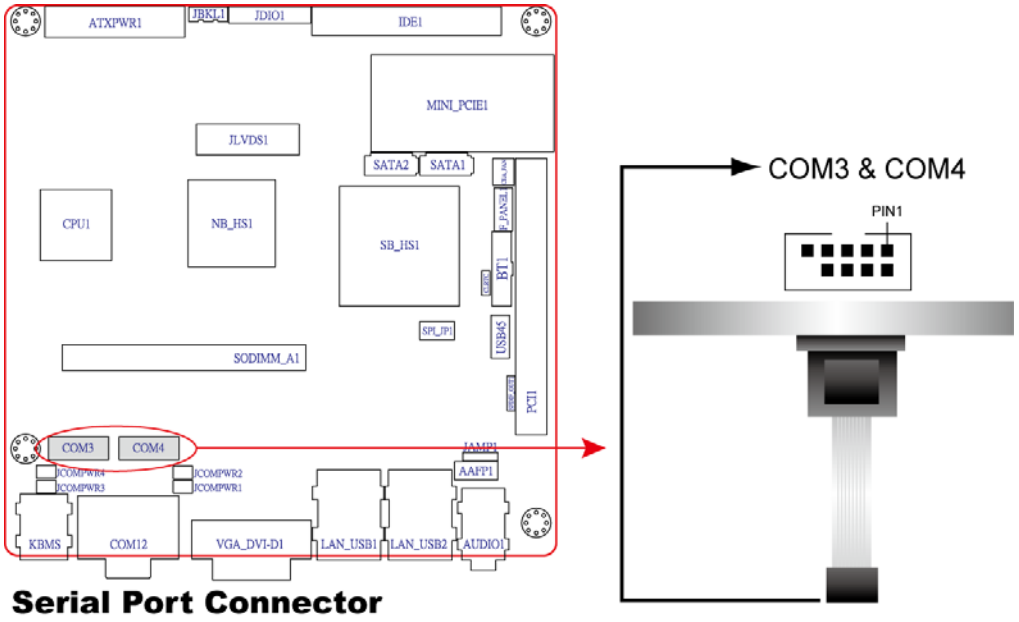


Front Panel Audio Connector

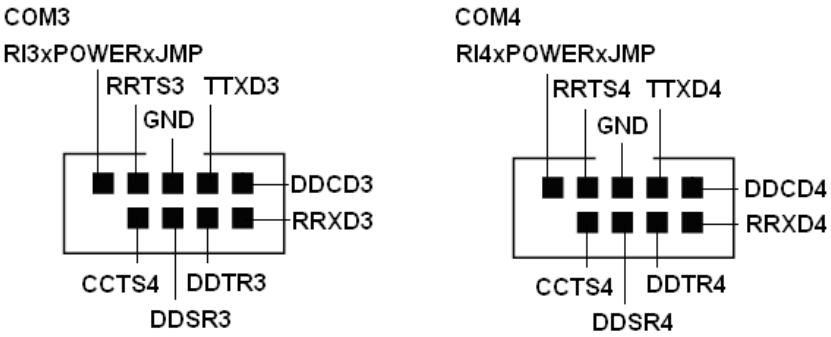
It is recommended that you connect a high-definition front panel audio module to this connector to avail of the motherboard's high-definition audio capability.

2. Serial Port connectors (9-pin COM3, COM4)

This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



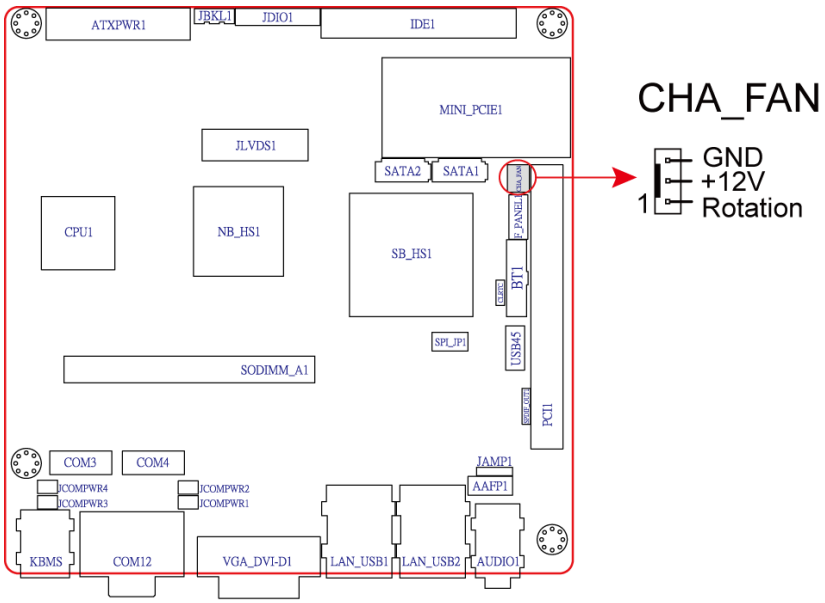
Serial Port Connector



3. CPU, Power and Chassis fan connectors (3-pin CHA_FAN)

The fan connectors support cooling fans of 350mA~740mA (8.88W max.) or a total of 1A~2.22A (26.64W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

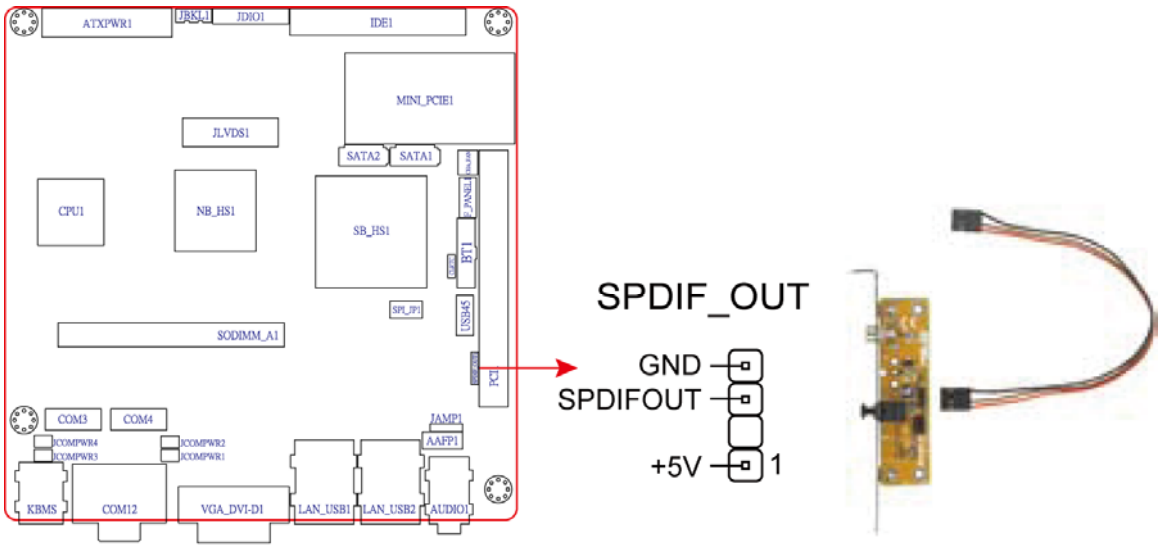
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! DO NOT place jumper caps on the fan connectors.



Fan Connector

4. Digital Audio connector (4-1 pin SPDIF_OUT)

This connector is for the S/PDIF audio module to allow digital sound output. Connect one end of the S/PDIF audio cable to this connector and the other end to the S/PDIF module.

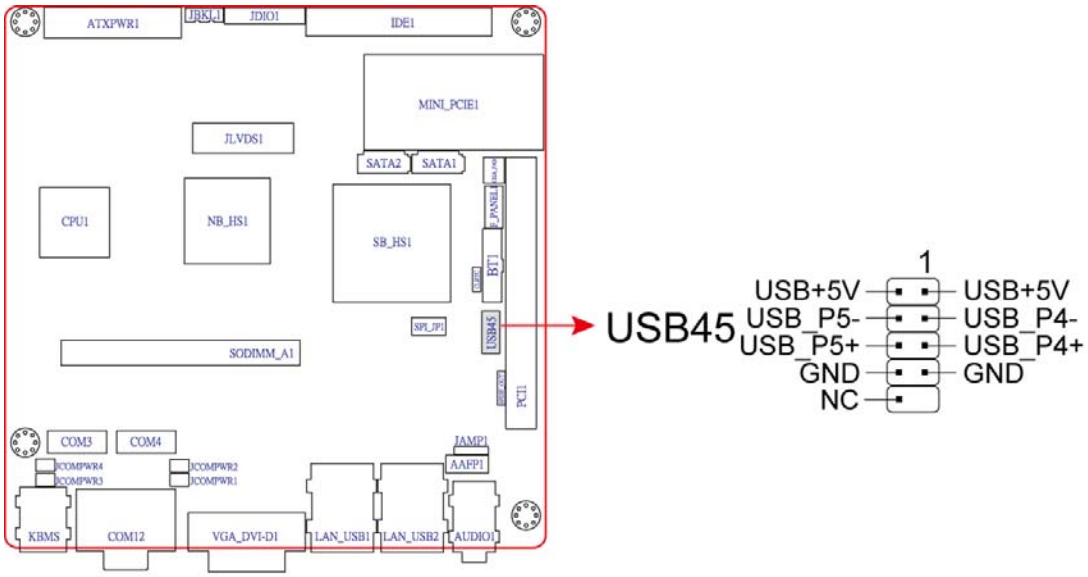


Digital Audio Connector

The S/PDIF out module is purchased separately.

5. USB connectors (10-1 pin USB45)

This connector is for USB 2.0 ports. Connect the optional USB module cable to any of these connectors, then install the module to a slot opening at the back of the system chassis. These USB connectors comply with USB 2.0 specification that supports up to 480 Mbps connection speed.



USB Connector

6. Primary IDE connector (40-1 pin IDE1)

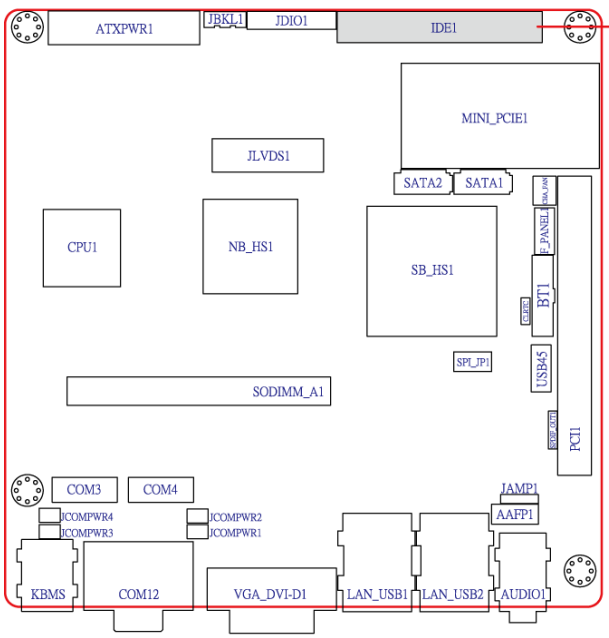
These connectors are for Ultra DMA 133/100/66 signal cables. There are three interfaces on each Ultra DMA 133/100/66 signal cable: blue, black, and gray.
Connect the blue interface into the motherboard's IDE connector, then select one of the following modes to configure your hard disk drive(s).

Cable Select Mode - use this mode to select the operating mode by cable connectors.

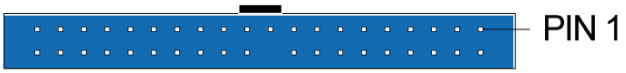
No. of drives	Drive type	Drive jumper	Cable connector
1	With OS	Cable select	black
2	With OS		black
	Without OS		gray

Jumper Select Mode - use this mode to select the operating mode by hard disk drive jumper.

No. of drives	Drive type	Drive jumper	Cable connector
1	With OS	Master	black or gray
2	With OS	Master	
	Without OS	Slave	



IDE Connector



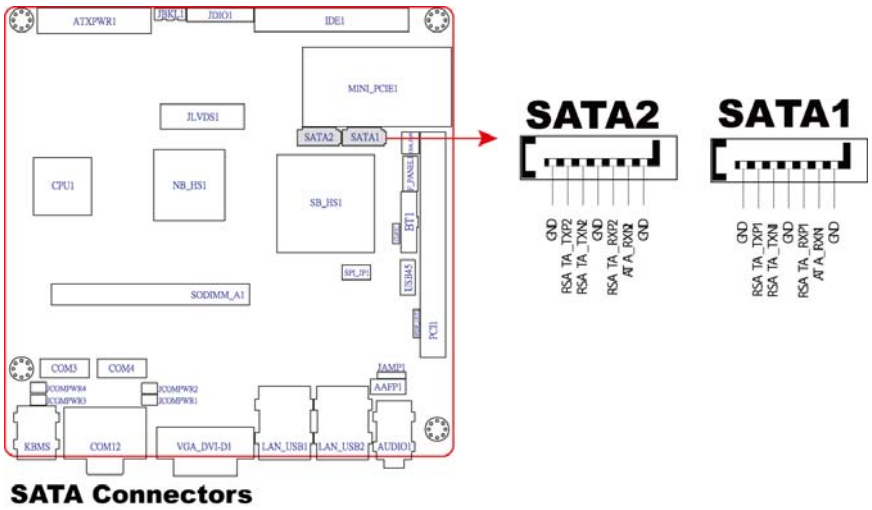
IDE

NOTE: Orient the red markings (usually zigzag) on the IDE ribbon cable to PIN 1.

7. Serial ATA connectors

(7-pin SATA1, SATA2)

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.



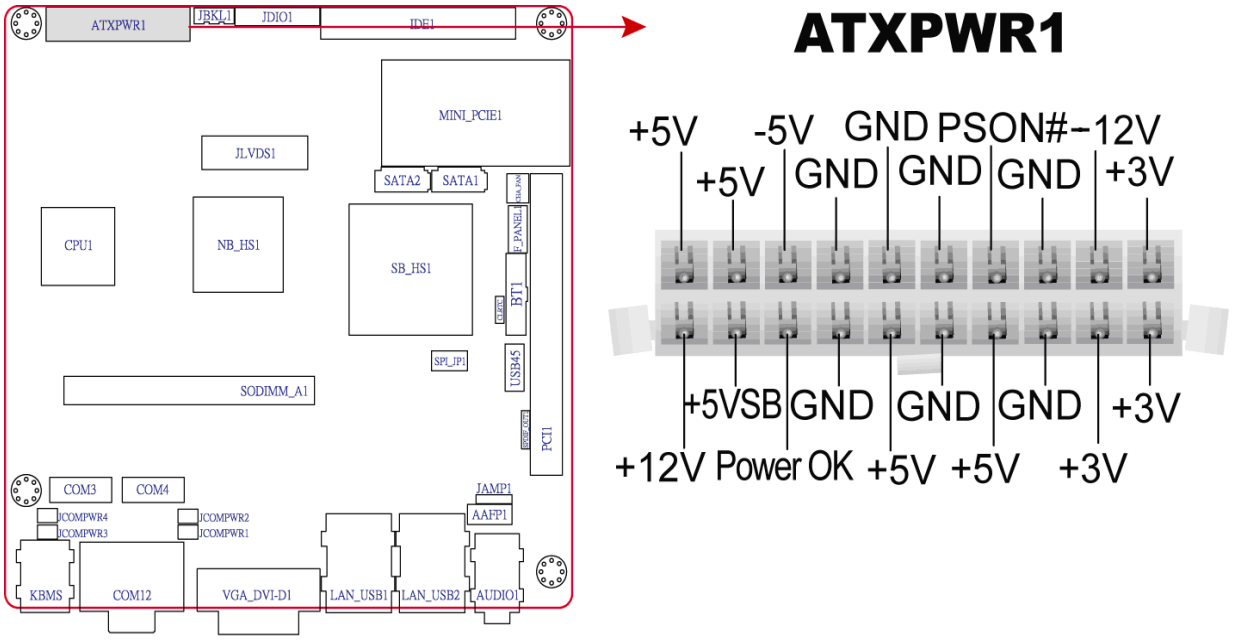
SATA Connectors

Install the Windows® 2000 Service Pack 4 or the Windows® XP Service Pack1 or later before using Serial ATA.

8. ATX power connectors (20-pin ATXPWR1)

The connector is for ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

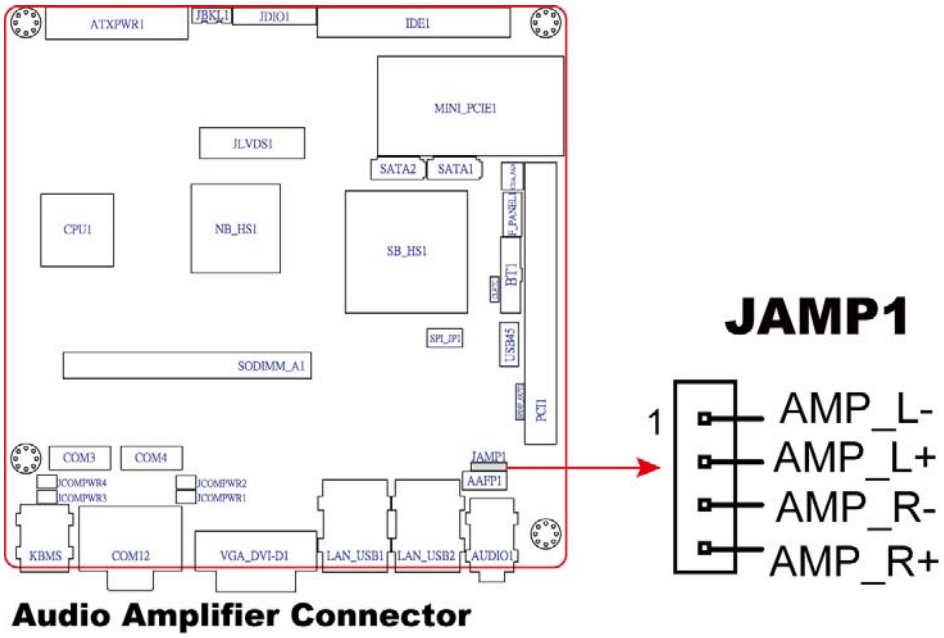
- Use of a PSU with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- Make sure that your power supply unit (PSU) can provide at least the minimum power required by your system. See the table below for details.



ATX Power Connectors

9. Audio Amplifier connectors (4-pin JAMP1)

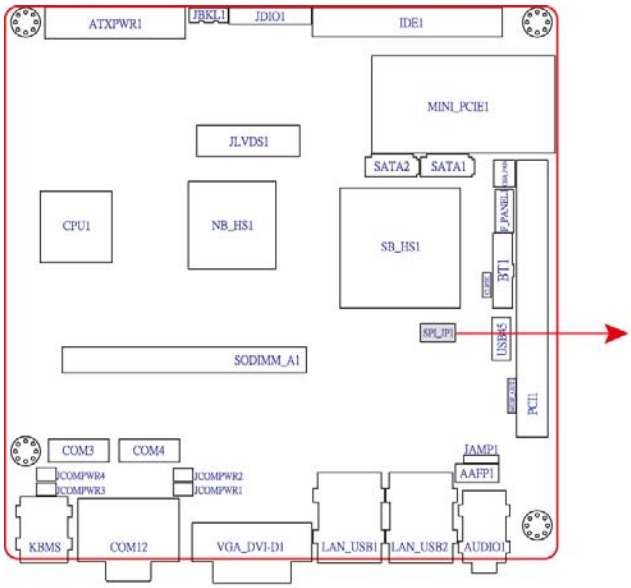
An amplifier connector is an electronic amplifier that amplifies low-power audio signals (signals composed primarily of frequencies between 20 hertz to 20,000 hertz, the human range of hearing) to a level suitable for driving loudspeakers and is the final stage in a typical audio playback chain.



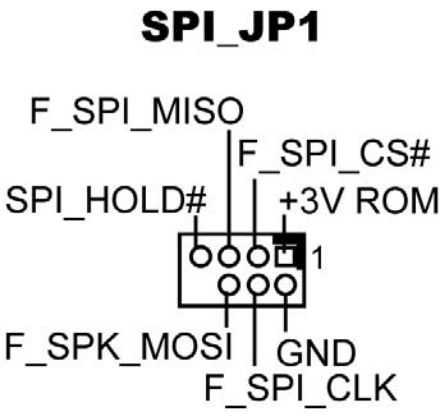
Audio Amplifier Connector

10. SPI Connector (7-pin SPI_JP1)

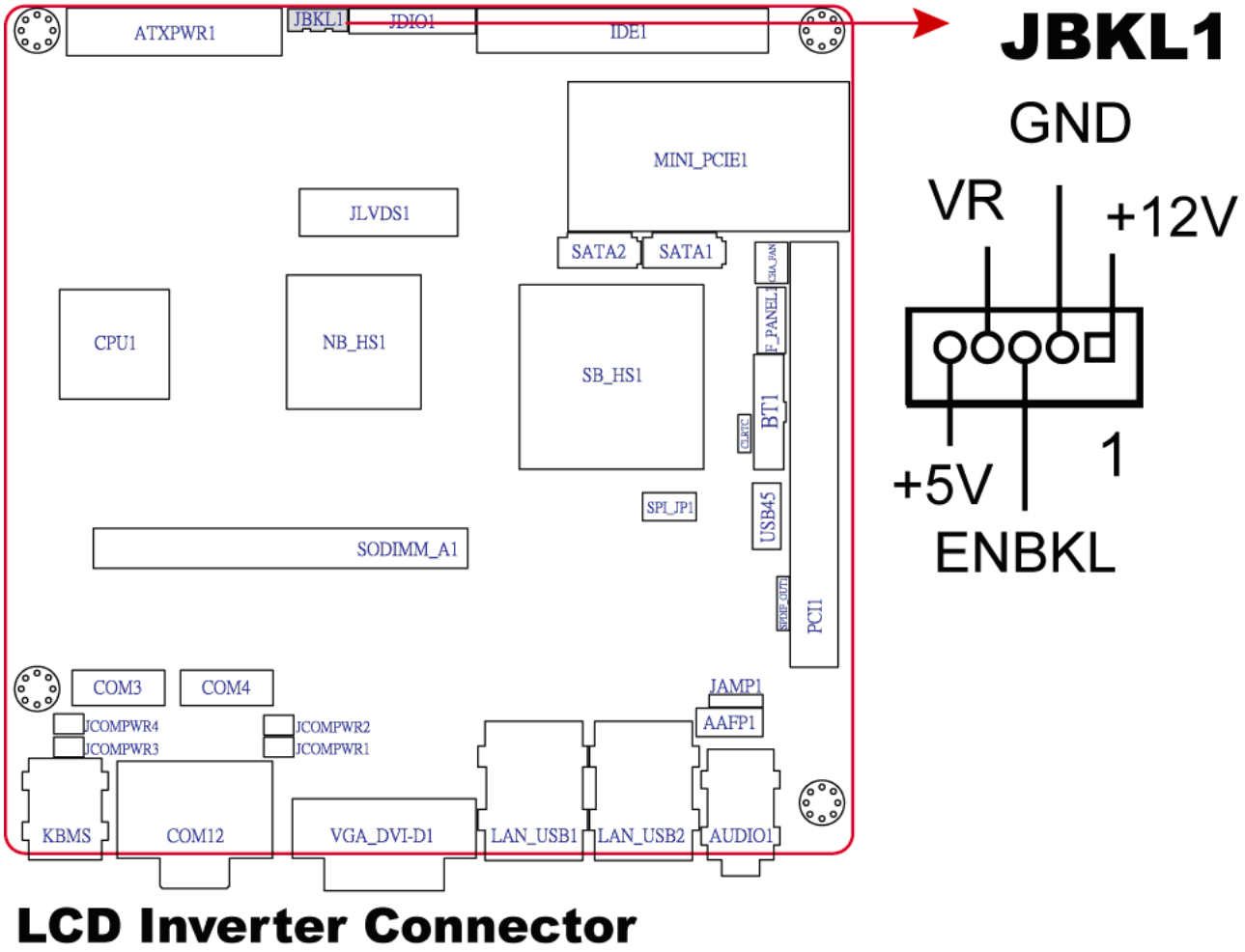
It is a point-to-point interface standard, allows network equipment designers to develop an array of next-generation multi-service switches and routers to support multi-service traffic with aggregate bandwidths up to OC-192 (10 Gb/s) and beyond, enabling them to dramatically increase system performance.



SPI Connector

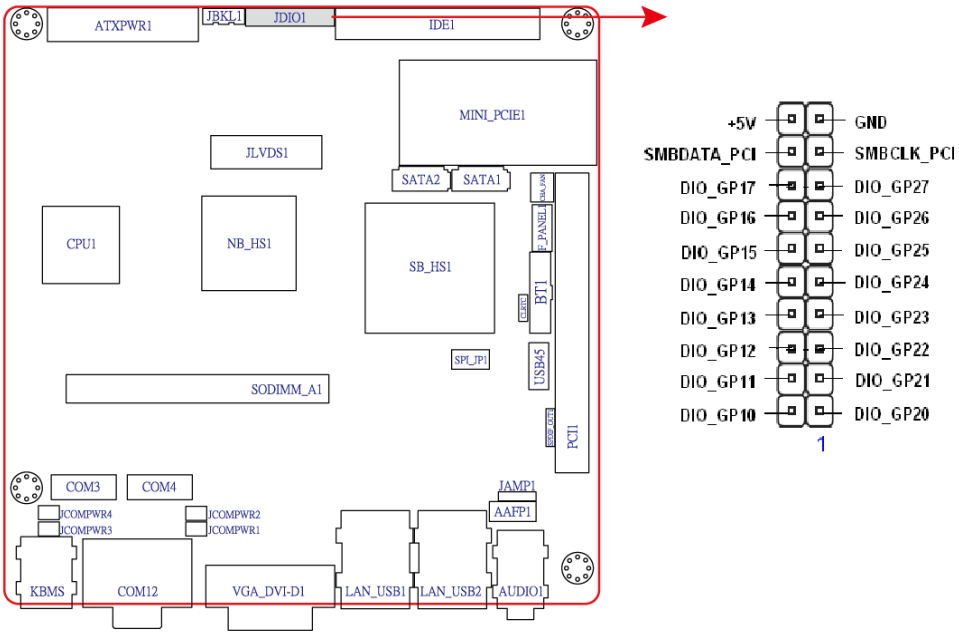


11. LCD Inverter Connector (5-pin JBKL)



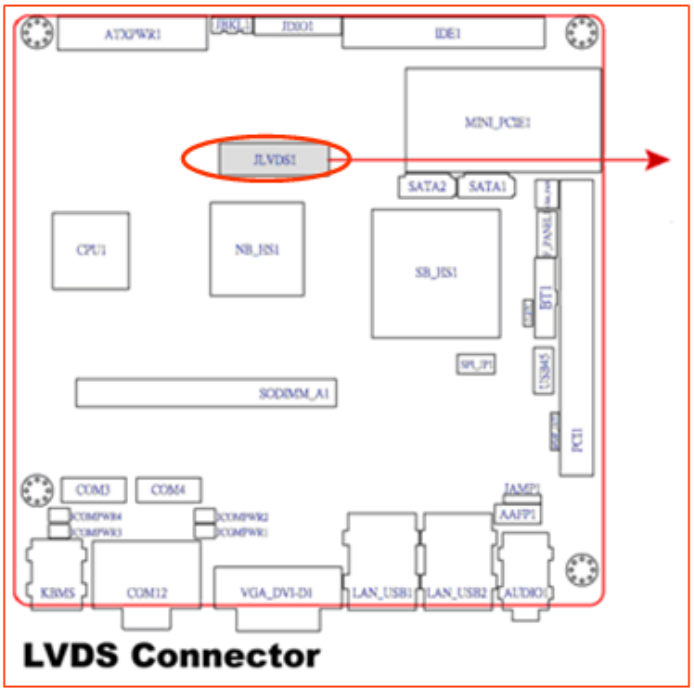
LCD Inverter Connector

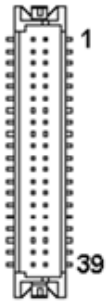
12. Digital IO Connector (20-pin JDIO)



13. LVDS Connector (40-pin JLVDS)

- **For EMX-945GSE-A1-DVIR : support 18bit x 2CH LVDS.**

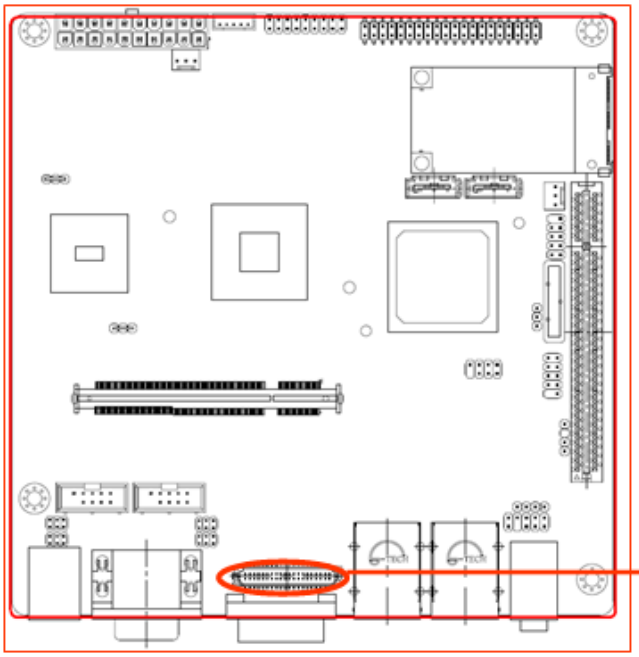




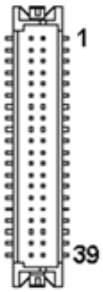
Signal	PIN	PIN	Signal
+5V	2	1	+3.3V
+5V	4	3	+3.3V
SD_DDC	6	5	SC_DDC
GND	8	7	GND
LVDS0_P0	10	9	LVDS0_P1
LVDS0_N0	12	11	LVDS0_N1
GND	14	13	GND
LVDS0_P2	16	15	NC
LVDS0_N2	18	17	NC
GND	20	19	GND
LVDS1_P0	22	21	LVDS1_P1
LVDS1_N0	24	23	LVDS1_N1
GND	26	25	GND
LVDS1_P2	28	27	NC
LVDS1_N2	30	29	NC
GND	32	31	GND
LVDS0_CLKP	34	33	LVDS1_CLKP
LVDS0_CLKN	36	35	LVDS1_CLKN
GND	38	37	GND
+12V	40	39	+12V

EMX-945GSE Series

- **For EMX-945GSE-A1R : support 24bit x 2CH LVDS.**



LVDS Connector



Signal	PIN	PIN	Signal
+5V	2	1	+3.3V
+5V	4	3	+3.3V
SD_DDC	6	5	SC_DDC
GND	8	7	GND
LVDS0_P0	10	9	LVDS0_P1
LVDS0_N0	12	11	LVDS0_N1
GND	14	13	GND
LVDS0_P2	16	15	LVDS0_P3
LVDS0_N2	18	17	LVDS0_N3
GND	20	19	GND
LVDS1_P0	22	21	LVDS1_P1
LVDS1_N0	24	23	LVDS1_N1
GND	26	25	GND
LVDS1_P2	28	27	LVDS1_P3
LVDS1_N2	30	29	LVDS1_N3
GND	32	31	GND
LVDS0_CLKP	34	33	LVDS1_CLKP
LVDS0_CLKN	36	35	LVDS1_CLKN
GND	38	37	GND
+12V	40	39	+12V

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

BIOS Setup 2

2.1 Managing and updating your BIOS

2.1.1 Creating a bootable floppy disk

1. Do either one of the following to create a bootable floppy disk.

   DOS environment

   a. Insert a 1.44MB floppy disk into the dirve.
   b. At the DOS prompt, type format **A:/S** then press <Enter>.

   Windows® XP environment

   a. Insert a 1.44 MB floppy disk to the floppy disk drive.
   b. Click **Start** from the Windows® desktop, then select **My Computer**.
   c. Select the 3 1/2 Floppy Drive icon.
   d. Click **File** from the menu, then select **Format**. A **Format 3 1/2 Floppy Disk** window appears.
   e. Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.

   Windows® 2000 environment

   To create a set of boot disks for Windows® 2000:

   a. Insert a formatted, high density 1.44 MB floppy disk into the drive.
   b. Insert the Windows® 2000 CD to the optical drive.
   c. Click **Start**, then select **Run**.d. From the Open field, type **D:\bootdisk\makeboot a:** assuming that D: is your optical drive.
   d. Press <Enter>, then follow screen instructions to continue.

2. Copy the original or the latest motherboard BIOS file to the bootable floppy disk.

2.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section "2.1 Managing and updating your BIOS."

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup". This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware hub.

The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program.
Press <Del> during the Power-On-Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Default Settings** item under the Exit Menu. See section "2.7 Exit Menu."
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the Avalue website to download the latest BIOS file for this motherboard.

2.2.1 Legend Box

The keys in the legend bar allow you to navigate through the various setup menus.

Key(s)	Function Description
F1	General help, only for Status Page Setup Menu and Option Page Setup Menu
Esc	Return to the main menu from a sub-menu or prompts you to quit the setup program
←, →	Move to the item in the left or right hand
↑, ↓	Move to previous or next item
Enter	Brings up a selection menu for the highlighted field
+ or PgUp	Moves the cursor to the first field
- or PgDn	Moves the cursor to the last field
F5	Loads the previous values
F6, F7	Loads the fail-safe / optimized defaults
F10	Saves changes and exits Setup

2.2.2 List Box

This box appears only in the opening screen. The box displays an initial list of configurable items in the menu you selected.

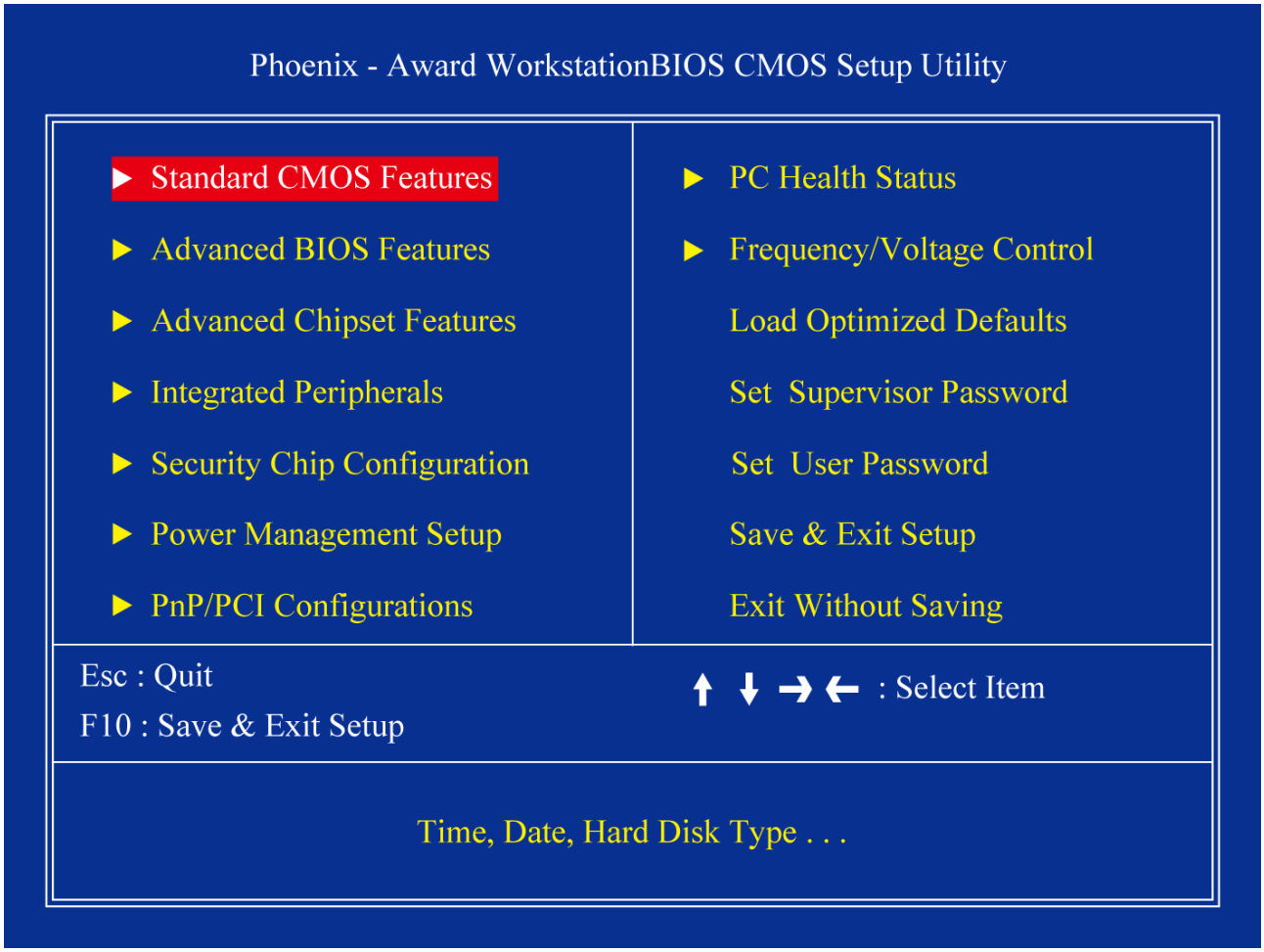
2.2.3 Sub-menu

Note that a right pointer symbol (▶) appears to the left of certain fields. This pointer indicates that you can display a sub-menu from this field. A sub-menu contains additional options for a field parameter. To display a sub-menu, move the highlight to the field and press <Enter>. The sub-menu appears. Use the legend keys to enter values and move from field to field within a sub-menu as you would within a menu. Use the <Esc> key to return to the main menu.

Take some time to familiarize yourself with the legend keys and their corresponding functions. Practice navigating through the various menus and submenus. If you accidentally make unwanted changes to any of the fields, press <F6> to load the fail-safe default values. While moving around through the Setup program, note that explanations appear in the Item Specific Help window located to the right of each menu. This window displays the help text for the currently highlighted field.

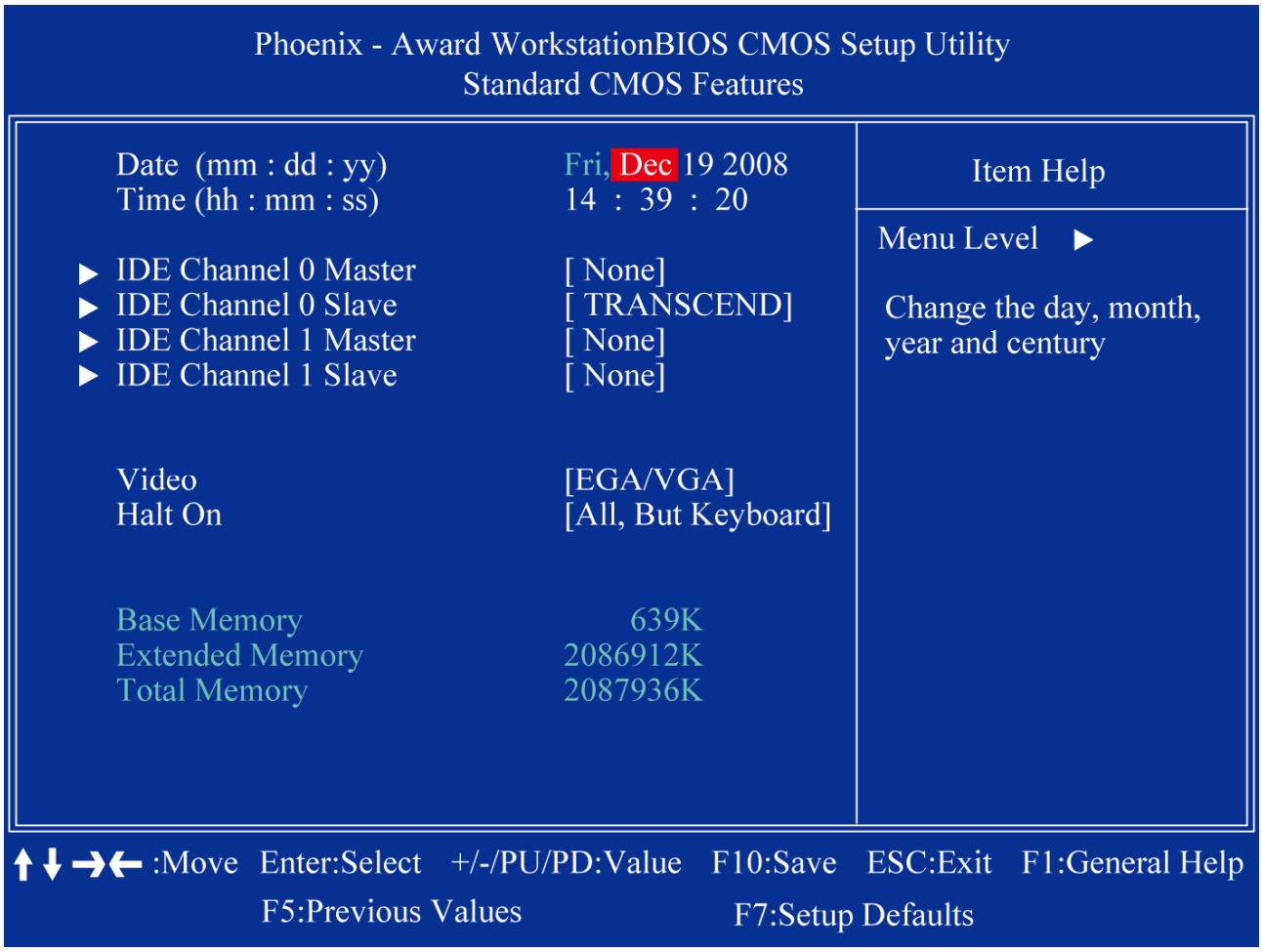
2.3 BIOS menu screen

When you enter the BIOS, the following screen appears. The BIOS menu screen displays the items that allow you to make changes to the system configuration. To access the menu items, press the up/down/right/left arrow key on the keyboard until the desired item is highlighted, then press [Enter] to open the specific menu.



2.3.1 Standard CMOS Features

The Standard CMOS Features screen gives you an overview of the basic system.


Phoenix - Award WorkstationBIOS CMOS Setup Utility
Standard CMOS Features
Date (mm : dd : yy) Fri, Dec 19 2008
Time (hh : mm : ss) 14 : 39 : 20
IDE Channel 0 Master [None]
IDE Channel 0 Slave [TRANSCEND]
IDE Channel 1 Master [None]
IDE Channel 1 Slave [None]
Video [EGA/VGA]
Halt On [All, But Keyboard]
Base Memory 639K
Extended Memory 2086912K
Total Memory 2087936K
Item Help
Menu Level ▶
Change the day, month, year and century
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

2.3.1.1 Date [Day, xx/xx/xxxx]

The date format is <week>, <month>, <day>, <year>.

2.3.1.2 Time [xx:xx:xx]

The time format is <hour> <minute> <second>, based on the 24-hour clock.

2.3.1.3 IDE Channel 0/1 Master / Slave

- **IDE HDD Auto-Detection**

  [Press Enter] to select this option for automatic device detection.

- **IDE Device Setup**

  [Auto]: Automatically detects IDE devices during POST

  [None]: Select this when no IDE device is used. The system will skip the auto-detection setup to make system start up faster.

[Manual]: User can manually input the correct settings.

- ✓ Access Mode: The options are CHS/LBA/Large/Auto
- ✓ Capacity: Capacity of currently installed hard disk
- ✓ Cylinder: Number of cylinders
- ✓ Head: Number of heads
- ✓ Precomp: Write precomp
- ✓ Landing Zone: Landing zone
- ✓ Sector: Number of sectors

2.3.1.4 Video

This category detects the type of adapter used for the primary monitor that must match your video display card and monitor.

- EGA / VGA: Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SVGA, or PGA monitor adapters.
- CGA 40: Color Graphics Adapter, power up in 40 column mode.
- CGA 80: Color Graphics Adapter, power up in 80 column mode.
- MONO: Monochrome adapter, includes high resolution monochrome adapters.

2.3.1.5 Halt On

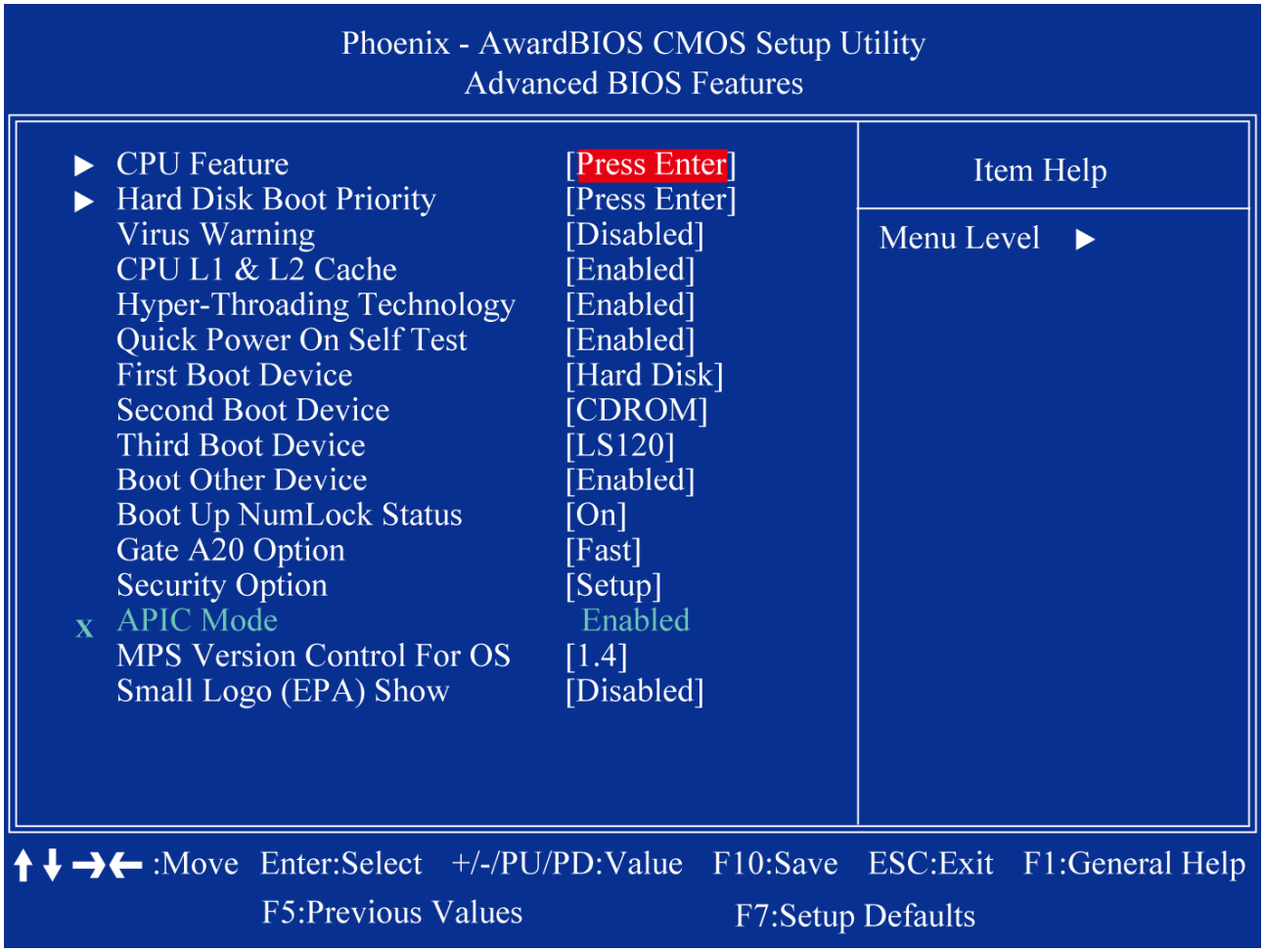
Sets the system to halt on errors according to the system functions specified in each option. Configuration options: [All Errors] [No Errors] [All, But Keyboard]

2.3.1.6 Memory

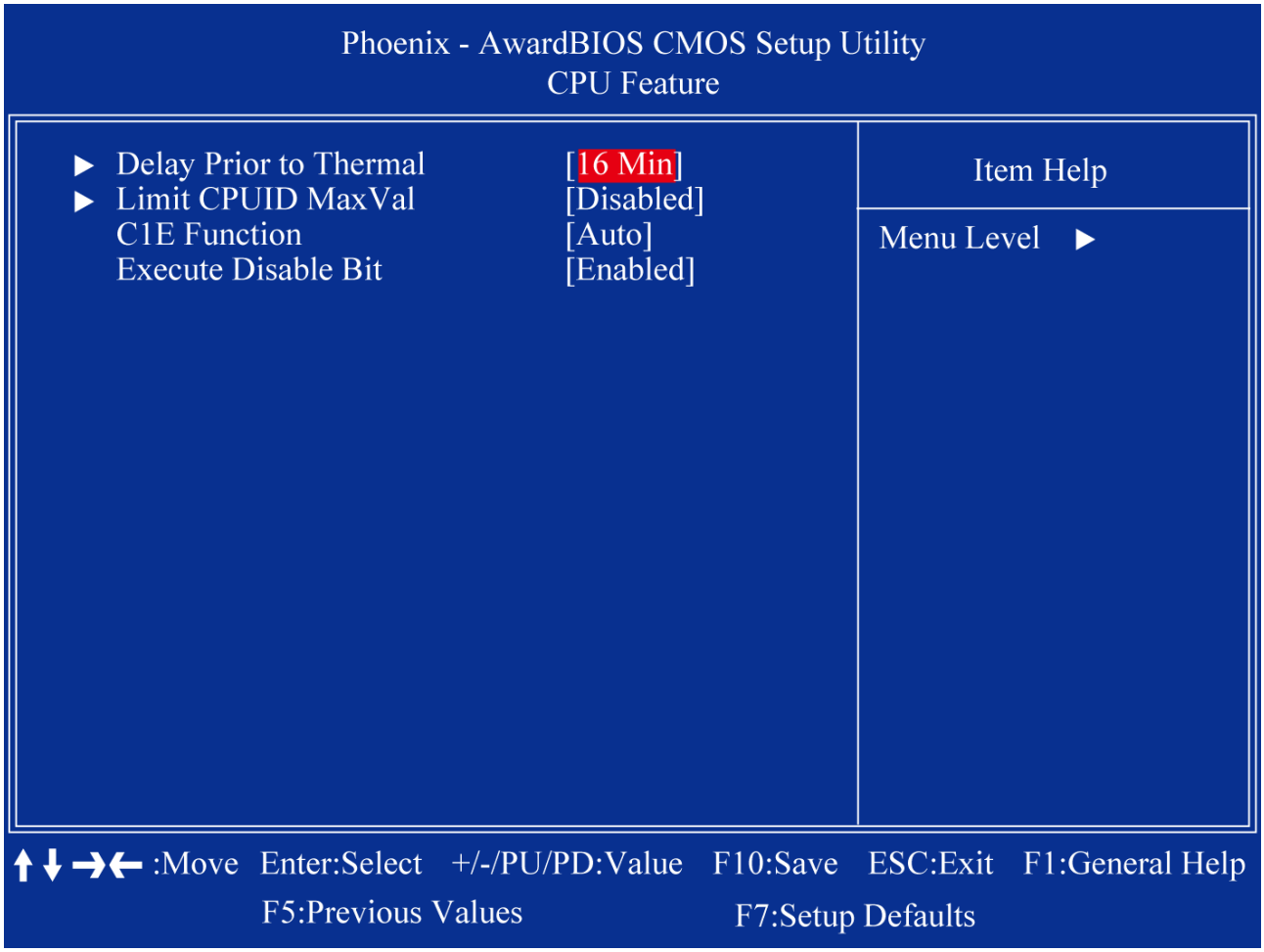
This category displays base memory, extended memory, and total memory detected during POST (Power On Self Test).

2.3.2 Advanced BIOS Features

The “Advanced BIOS Features” screen appears when choosing the “Advanced BIOS Features” item from the “Initial Setup Screen” menu. It allows the user to configure the RX945G according to his particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen. A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time.


Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features
▶ CPU Feature [Press Enter]
▶ Hard Disk Boot Priority [Press Enter]
Virus Warning [Disabled]
CPU L1 & L2 Cache [Enabled]
Hyper-Throading Technology [Enabled]
Quick Power On Self Test [Enabled]
First Boot Device [Hard Disk]
Second Boot Device [CDROM]
Third Boot Device [LS120]
Boot Other Device [Enabled]
Boot Up NumLock Status [On]
Gate A20 Option [Fast]
Security Option [Setup]
x APIC Mode Enabled
MPS Version Control For OS [1.4]
Small Logo (EPA) Show [Disabled]
Item Help
Menu Level ▶
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

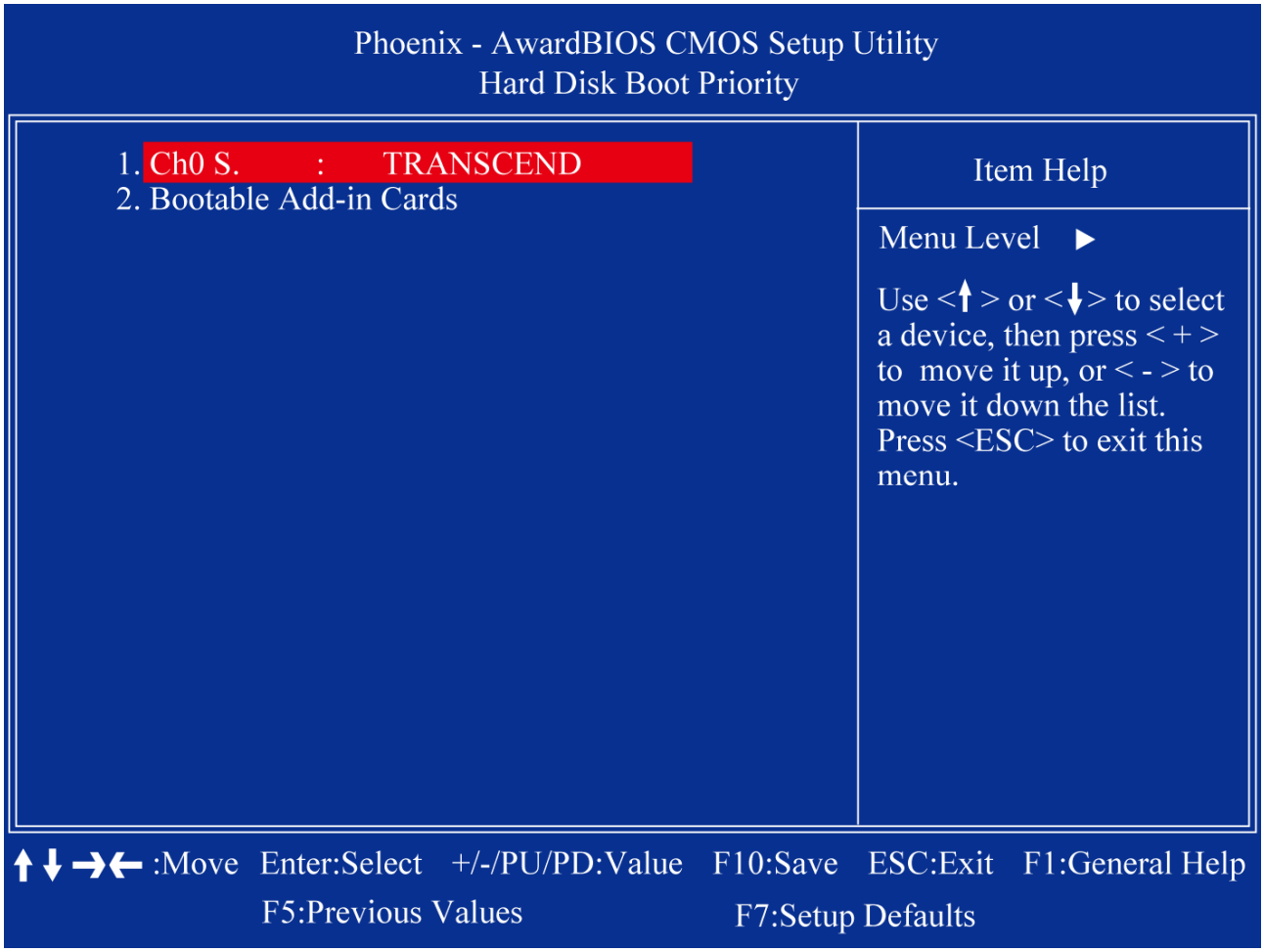
2.3.2.1 CPU Feature


Phoenix - AwardBIOS CMOS Setup Utility
CPU Feature
Delay Prior to Thermal [16 Min]
Limit CPUID MaxVal [Disabled]
C1E Function [Auto]
Execute Disable Bit [Enabled]
Item Help
Menu Level ▶
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

- Delay Prior to Thermal
  The Delay Prior To Thermal BIOS feature controls the activation of the Thermal Monitor's automatic mode. It allows you to determine when the Pentium 4's Thermal Monitor should be activated in automatic mode after the system boots. For example, with the default value of 16 Minutes, the BIOS activates the Thermal Monitor in automatic mode 16 minutes after the system starts booting up.
- Limit CPUID MaxVal
  Set Limit CPUID MaxVa1 to 3. This should be disabled for WinXP
- C1E Function
  CPU C1E function select
- Execute Disable Bit
  When disabled, forces the XD feature flag to always return 0

Hard Disk Boot Priority

Set hard disk boot device priority**.**


Phoenix - AwardBIOS CMOS Setup Utility
Hard Disk Boot Priority
1. Ch0 S. : TRANSCEND
2. Bootable Add-in Cards
Item Help
Menu Level ▶
Use <↑> or <↓> to select a device, then press <+> to move it up, or <-> to move it down the list. Press <ESC> to exit this menu.
↑↓→← :Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

- CH0 S.

Primary SATA channel with Master Device. It will show the device model / type when SATA HDD or CD ROM connected.

- Bootable Add-in Cards

"Bootable add-in cards" is an item on the HDD boot priority list.

2.3.2.2 Virus Warning

Enables or disables the virus warning.

Item	Description
Enable	Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector or hard disk partition table.
Disable	No warning message will appear when anything attempts to access the boot sector or hard disk partition table.

2.3.2.3 CPU L1 & L2 Cache

Enabling this feature speeds up memory access.

Item	Description

Enable	Enable cache
Disable	Disable cache

2.3.2.4 Hyper Threading Technology

System will detect automatically and show up when you installed the Intel® Pentium® 4 processor with HT Technology. Set to "Enabled" for faster system performance.

2.3.2.5 Quick Power On Self Test

This allows the system to skip certain tests to speed up the boot-up procedure.

Item	Description
Enable	Enable quick POST
Disable	Normal POST

2.3.2.6 First / Second / Third Boot Device

The BIOS tries to load the OS from the devices in the sequence set here. The options are:

Item	Description
LS120	LS120 Device
HDD	Hard Disk Device
CDROM	CDROM Device
ZIP100	ZIP-100 Device
USB-FDD	USB Floppy Device
USB-ZIP	USB ZIP Device
USB-CDROM	USB CDROM Device
USB-HDD	USB Hard Disk Device
Legacy LAN	Network Device
Disabled	Disabled any boot device

2.3.2.7 Boot Other Device

Use this to boot another device. The options are "Enabled" and "Disabled".

2.3.2.8 Boot Up NumLock Status

Sets the boot up Num Lock status. The options are "On" and "Off".

Item	Description
On	Enable NumLock
Off	Disable NumLock

2.3.2.9 Gate A20 Option

Item	Description
Normal	A pin in the keyboard controller controls GateA20
Fast	Lets chipset control GateA20 (Default)

2.3.2.10 Security Option

This category determines whether the password is required when the sys- tem boots up or only when entering setup. The options are:

Item	Description
System	The system will not boot and access to Setup will be denied if the

	correct password is not entered at the prompt.
Setup	The system will boot, but access to Setup will be denied if the correct password is not entered at the prompt.

To disable security, select PASSWORD SETTING at Main Menu and then you will be asked to enter password. Do not type anything and just press <Enter>, it will disable security. Once the security is disabled, the system will boot and you can enter Setup freely.

2.3.2.11 APIC Mode

This setting allows you to enable the APIC mode. The choices are “Disabled” or “Enabled.”

2.3.2.12 MPS Version Control for OS

This option is only valid for multiprocessor motherboards as it specifies the version of the Multiprocessor Specification (MPS) that the motherboard will use. The MPS is a specification by which PC manufacturers design and build Intel architecture systems with two or more processors.

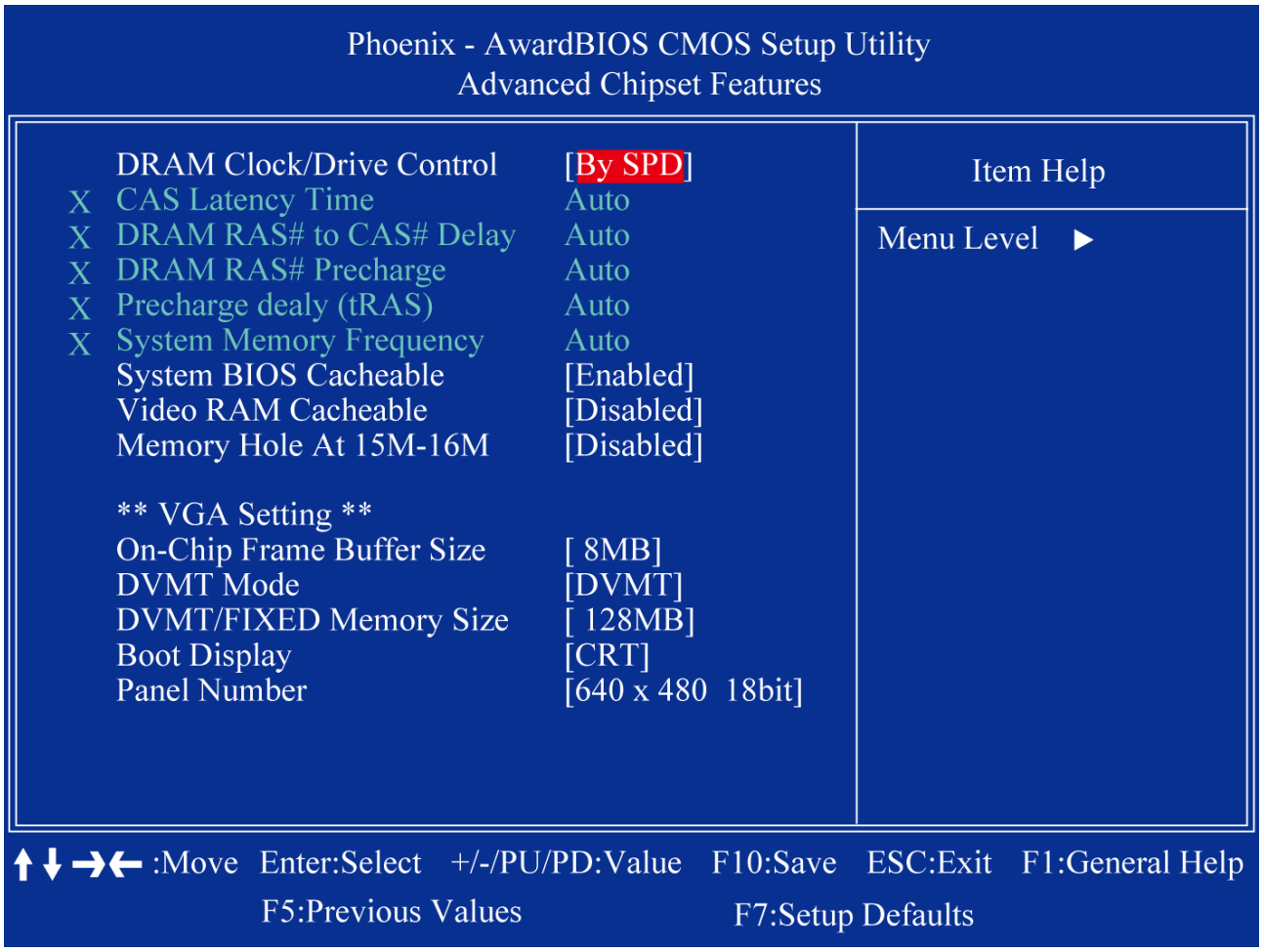
MPS 1.1 was the original specification. MPS version 1.4 adds extended configuration tables for improved support of multiple PCI bus configurations and greater expandability in the future. In addition, MPS 1.4 introduces support for a secondary PCI bus without requiring a PCI bridge.

2.3.2.13 Small Logo (EPA) Show

This item allows you enabled/disabled the small EPA logo show on screen at the POST step.

Item	Description
Enabled	EPA Logo shows is enabled
Disabled	EPA logo show is disabled

2.3.3 Advanced Chipset Features


Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features
DRAM Clock/Drive Control [By SPD]
X CAS Latency Time Auto
X DRAM RAS# to CAS# Delay Auto
X DRAM RAS# Precharge Auto
X Precharge dealy (tRAS) Auto
X System Memory Frequency Auto
System BIOS Cacheable [Enabled]
Video RAM Cacheable [Disabled]
Memory Hole At 15M-16M [Disabled]
** VGA Setting **
On-Chip Frame Buffer Size [8MB]
DVMT Mode [DVMT]
DVMT/FIXED Memory Size [128MB]
Boot Display [CRT]
Panel Number [640 x 480 18bit]
Item Help
Menu Level ▶
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

2.3.3.1 DRAM Clock/Drive Control

When select to "BySPD", the DRAM timing parameters are set according to DRAM SPD (Serial Presence Detect). When disabled, one can manually set the DRAM timing parameters through the sub items below. Set to "BySPD" if not sure.

2.3.3.2 CAS Latency Time

Controls the latency between the SDRAM Read command and the time data actually becomes available.

2.3.3.3 DRAM RAS# to CAS# Delay

Controls the latency between the DDR SDRAM active command and the read/write command.

2.3.3.4 DRAM RAS# Precharge

Controls the idle clocks after issuing a precharge command to the DDRSDRAM.

2.3.3.5 Precharge delay (tRAS)

Precharge Delay This setting controls the precharge delay, which determines the timing delay for DRAM precharge.

2.3.3.6 System Memory Frequency

Allow to choose different frequency of memory module.

2.3.3.7 System BIOS Cacheable

Selecting “Enabled” allows caching of the system BIOS ROM at F0000h- FFFFFh, resulting in better system performance. However, if any pro-gram writes data to this memory area, a system error may occur.

2.3.3.8 Video BIOS Cacheable

Selecting Enabled allows caching of the video BIOS ROM at F0000h-FFFFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

2.3.3.9 Memory Hole At 15M-16M

Enabling this feature reserves 15 MB to 16 MB memory address space for ISA expansion cards that specifically require this setting. This makes memory from 15 MB and up unavailable to the system. Expansion cards can only access memory up to 16 MB. The default setting is “Disabled”.

2.3.3.10 On-Chip Frame Buffer Size

The On-Chip Frame Buffer Size can be set as 1MB or 8MB. This memory is shared with the system memory.

2.3.3.11 DVMT Mode

Use this field to select the memory to allocate for video memory. The choices are “Fixed”, “DVMT” and “BOTH”.

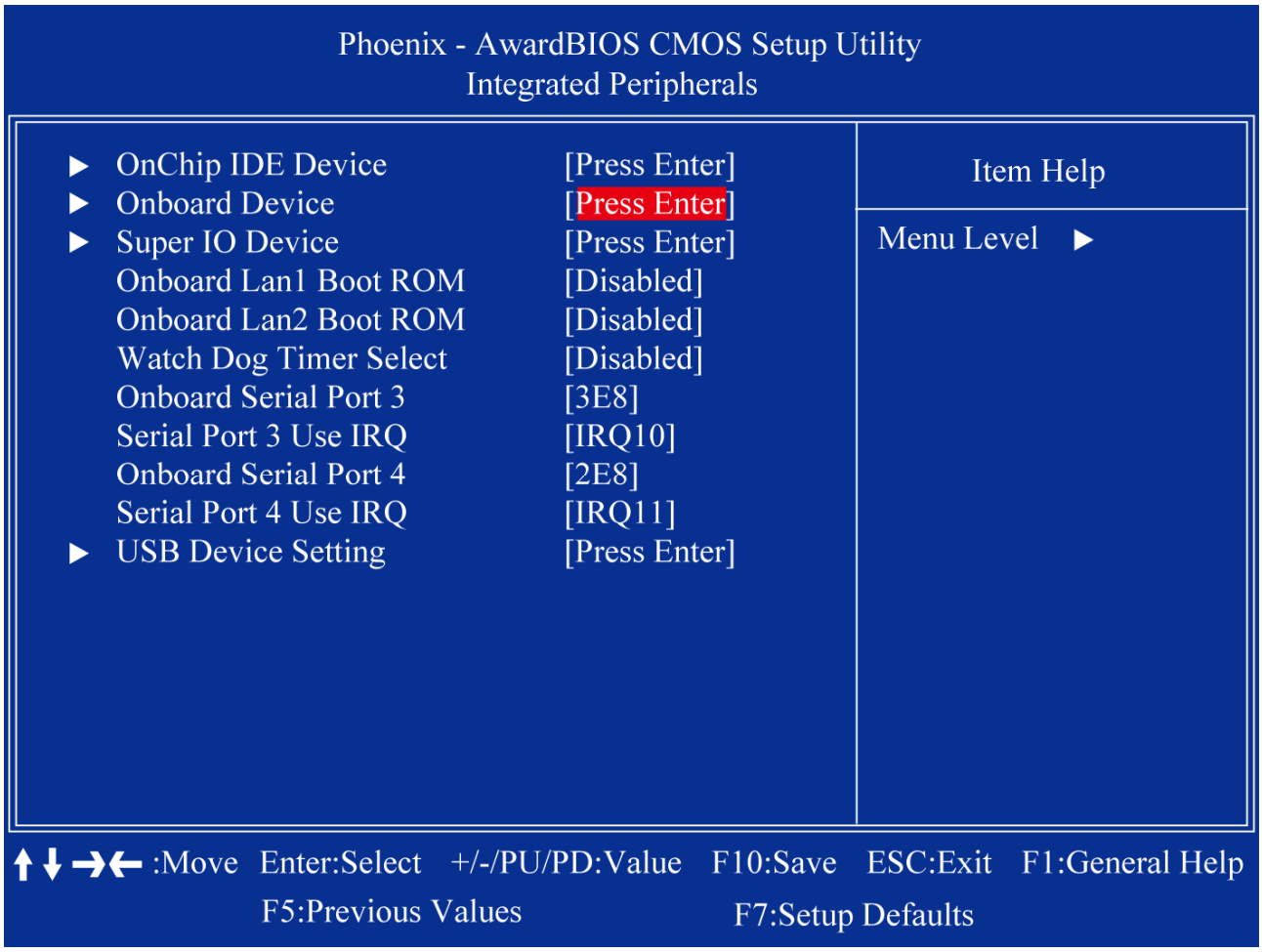
2.3.3.12 DVMT/FIXED Memory Size

Specify the size of DVMT/system memory to allocate for video memory.

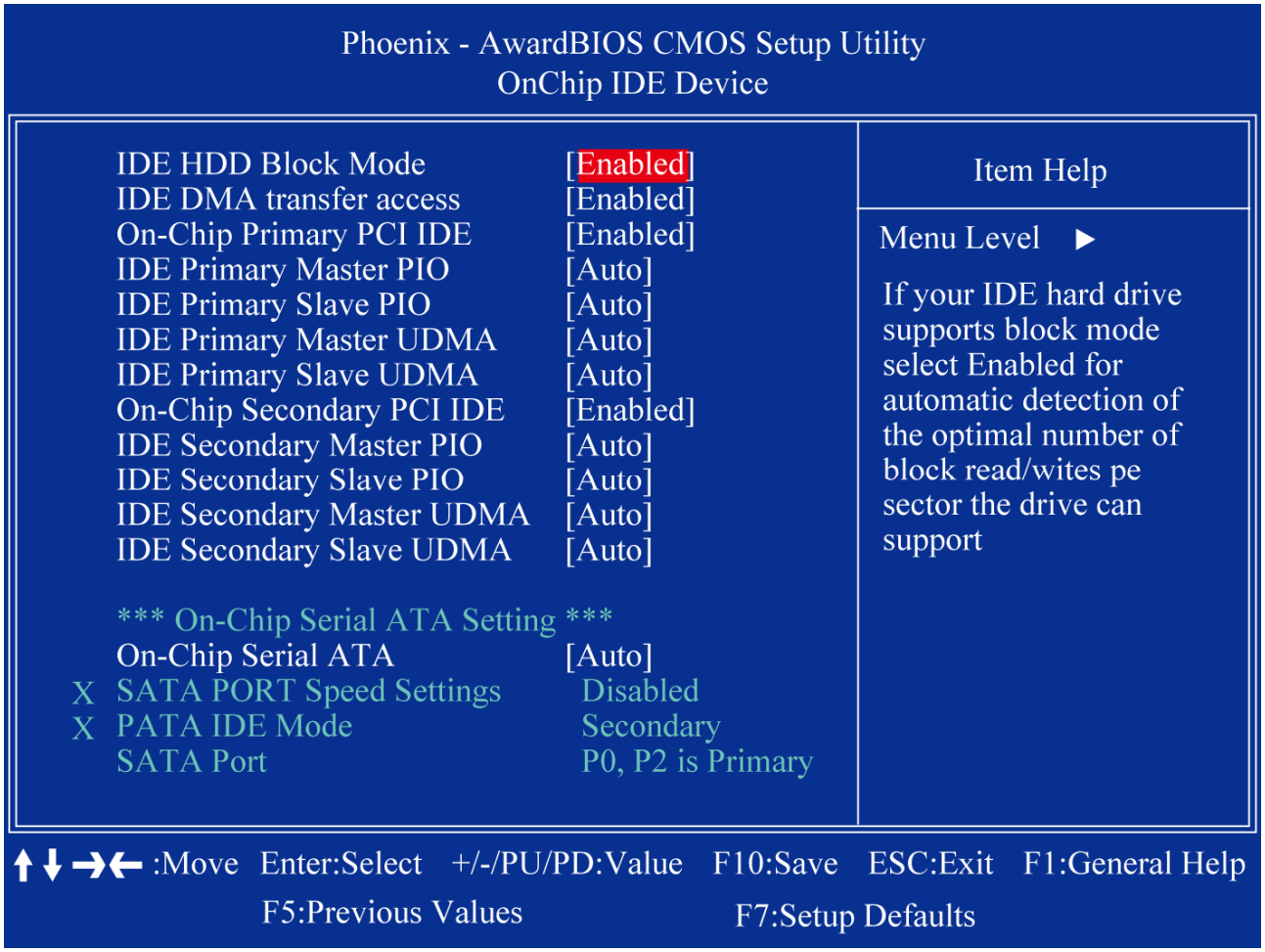
2.3.3.13 Boot Display

2.3.3.14 Panel Number

2.3.4 Integrated Peripherals


Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals
OnChip IDE Device [Press Enter]
Onboard Device [Press Enter]
Super IO Device [Press Enter]
Onboard Lan1 Boot ROM [Disabled]
Onboard Lan2 Boot ROM [Disabled]
Watch Dog Timer Select [Disabled]
Onboard Serial Port 3 [3E8]
Serial Port 3 Use IRQ [IRQ10]
Onboard Serial Port 4 [2E8]
Serial Port 4 Use IRQ [IRQ11]
USB Device Setting [Press Enter]
Item Help
Menu Level ▶
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

2.3.4.1 OnChip IDE Device

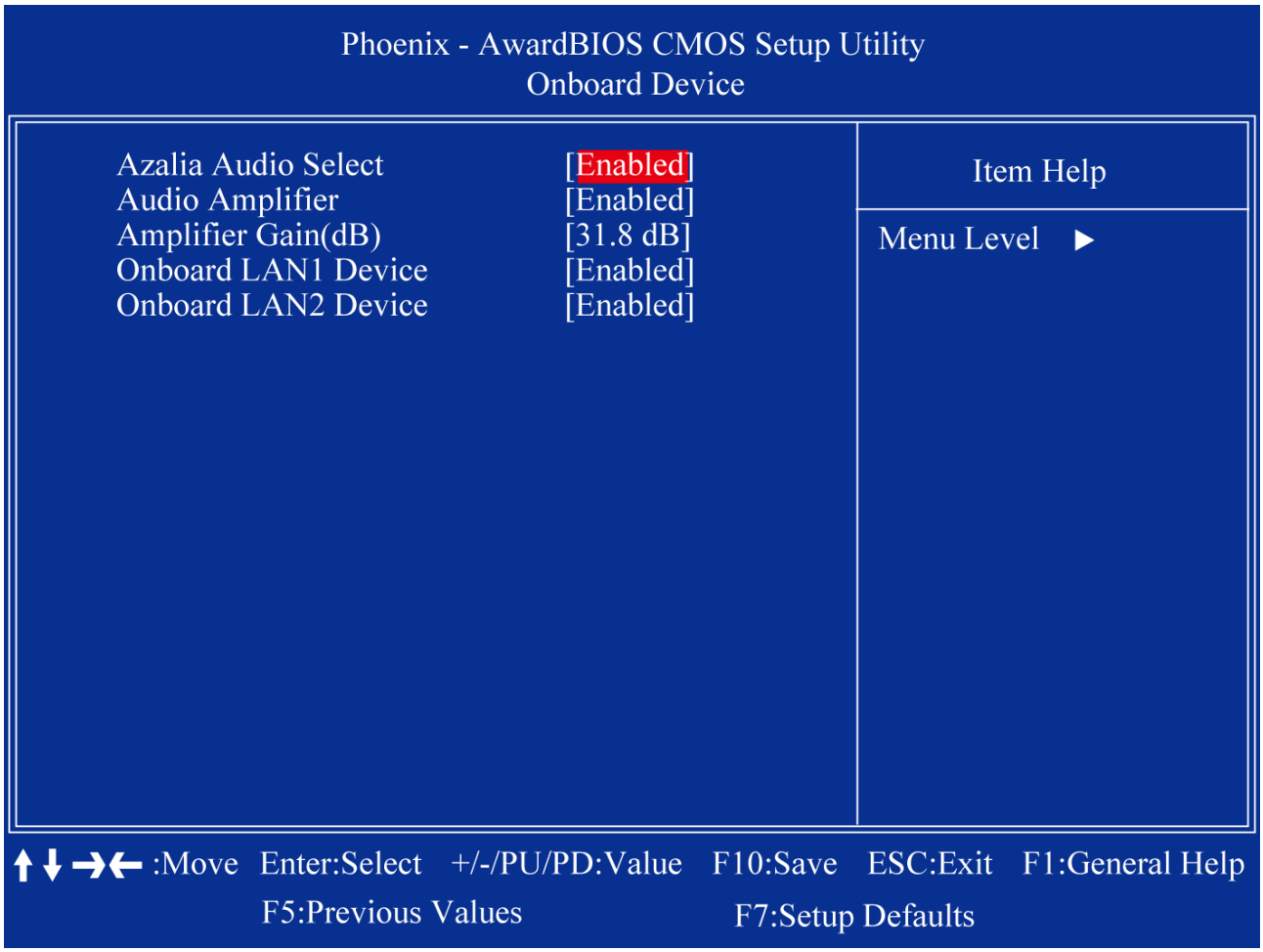

Phoenix - AwardBIOS CMOS Setup Utility
OnChip IDE Device
IDE HDD Block Mode [Enabled]
IDE DMA transfer access [Enabled]
On-Chip Primary PCI IDE [Enabled]
IDE Primary Master PIO [Auto]
IDE Primary Slave PIO [Auto]
IDE Primary Master UDMA [Auto]
IDE Primary Slave UDMA [Auto]
On-Chip Secondary PCI IDE [Enabled]
IDE Secondary Master PIO [Auto]
IDE Secondary Slave PIO [Auto]
IDE Secondary Master UDMA [Auto]
IDE Secondary Slave UDMA [Auto]
*** On-Chip Serial ATA Setting ***
On-Chip Serial ATA [Auto]
X SATA PORT Speed Settings Disabled
X PATA IDE Mode Secondary
SATA Port P0, P2 is Primary
Item Help
Menu Level ▶
If your IDE hard drive supports block mode select Enabled for automatic detection of the optimal number of block read/wites pe sector the drive can support
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

- IDE HDD Block Mode
  Block mode is also called block transfer, multiple commands, or multiple sector read/write. If your IDE hard drive supports block mode (most new drives do), select Enabled for automatic detection of the optimal number of block read/writes per sector the drive can support
- IDE DMA transfer access
  To Enable/Disable the IDE DMA transfer access
- OnChip Primary PCI IDE
  The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select Enabled to activate each channel separately
- IDE Primary/Secondary Master/ Slave PIO
  The four IDE PIO fields allow you to set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.
- IDE Primary/Secondary Master/ Slave UDMA
  Ultra DMA/33 implementation is possible only if your IDE hard drive supports it and the

operating environment includes a DMA driver (Windows 95 OSR2 or a third-party IDE bus master driver). If you hard drive and your system software both support Ultra DMA/33, select Auto to enable BIOS support

- On-Chip Secondary PCI IDE
  Enable the secondary IDE channel
- On-Chip SATA Controller
  To select Serial ATA mode. The choices are "Native IDE" / "RAID" / "AHCI" / "Legacy IDE".
- SATA Port Speed Settings
- PATA IDE Mode
- SATA Port

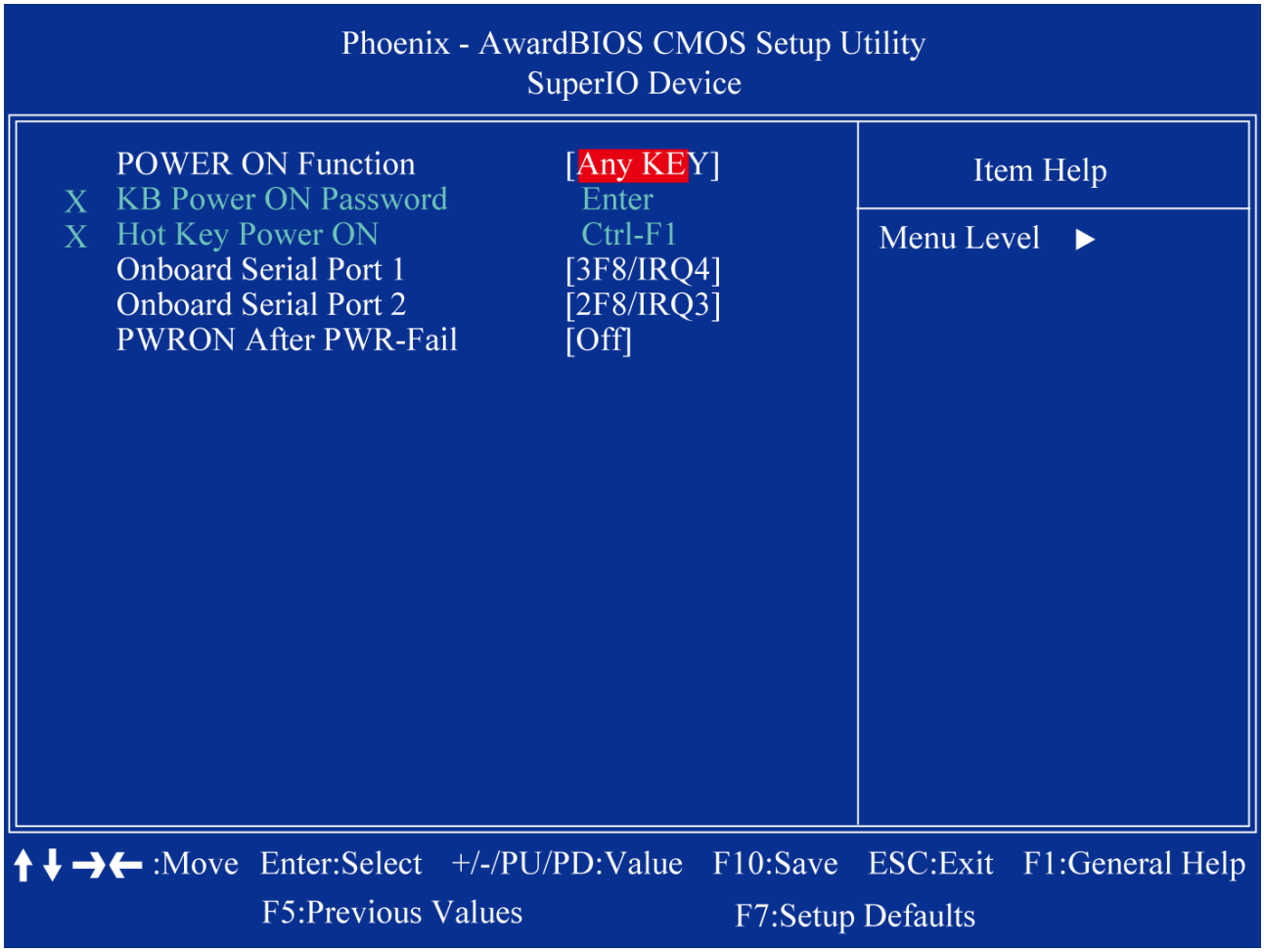
2.3.4.2 Onboard Device



- Azalia Audio Select
  Select [Disabled] if you do not want to use Azalia audio. Configuration options: [Auto] [Disabled]
- Audio Amplifier
- Amplifier Gain(dB)
- Onboard LAN1 Device

- Onboard LAN2 Device

2.3.4.3 SuperIO Device


Phoenix - AwardBIOS CMOS Setup Utility
SuperIO Device
POWER ON Function [Any KEY]
X KB Power ON Password Enter
X Hot Key Power ON Ctrl-F1
Onboard Serial Port 1 [3F8/IRQ4]
Onboard Serial Port 2 [2F8/IRQ3]
PWRON After PWR-Fail [Off]
Item Help
Menu Level ▶
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

- POWER ON Function
- KB Power ON Password
  The system will ask for a password, after entering the correct password the keyboard can then be used.
- Hot Key Power ON
  Awaken the system by pressing the hot key button. The choices are “Ctrl-F1”, “Ctrl-F2”, “Ctrl-F3” to “Ctrl-F8”.
- Onboard Serial Port 1/2
  The settings are “3F8/IRQ4”, “2F8/IRQ3”, “3E8/IRQ4”, “2E8/IRQ3”, and “Disabled” for the on-board serial connector.
- PWRON After PWR-Fail
  This item allows you to select if you want to power on the system after power failure. The choice: Off, On, Former-Sts.

2.3.4.4 Onboard Lan1/2 Boot ROM

The choices: Enable, Disable.

2.3.4.5 Watch Dog Timer Select

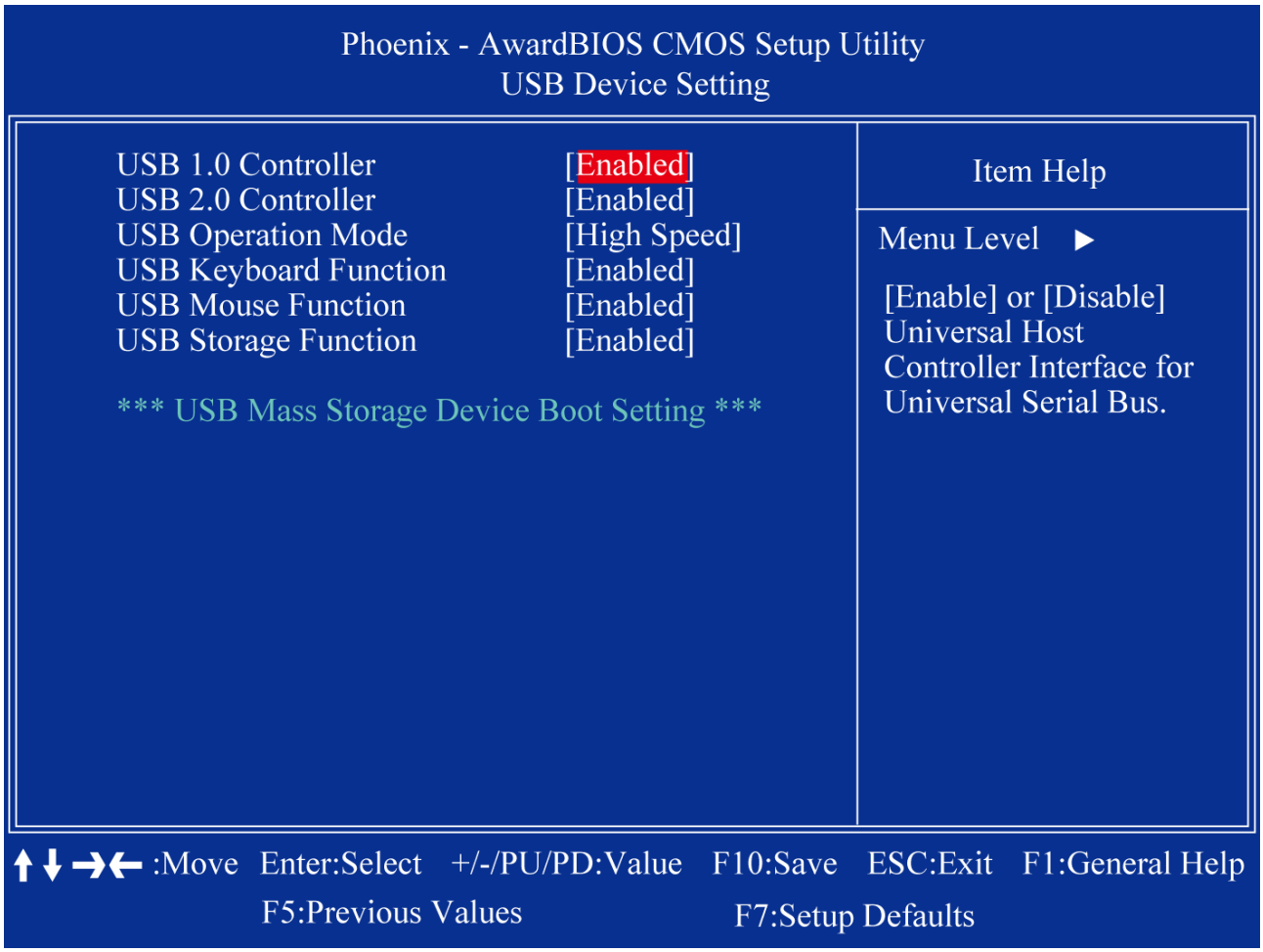
This option will determine watch dog timer. The choices: Disabled, 10, 20, 30, 40 Sec. 1, 2, 4 Min.

2.3.4.6 Onboard Serial Port 3/4

The settings are "3F8/IRQ4", "2F8/IRQ3", "3E8/IRQ4", "2E8/IRQ3", and "Disabled" for the on-board serial connector.

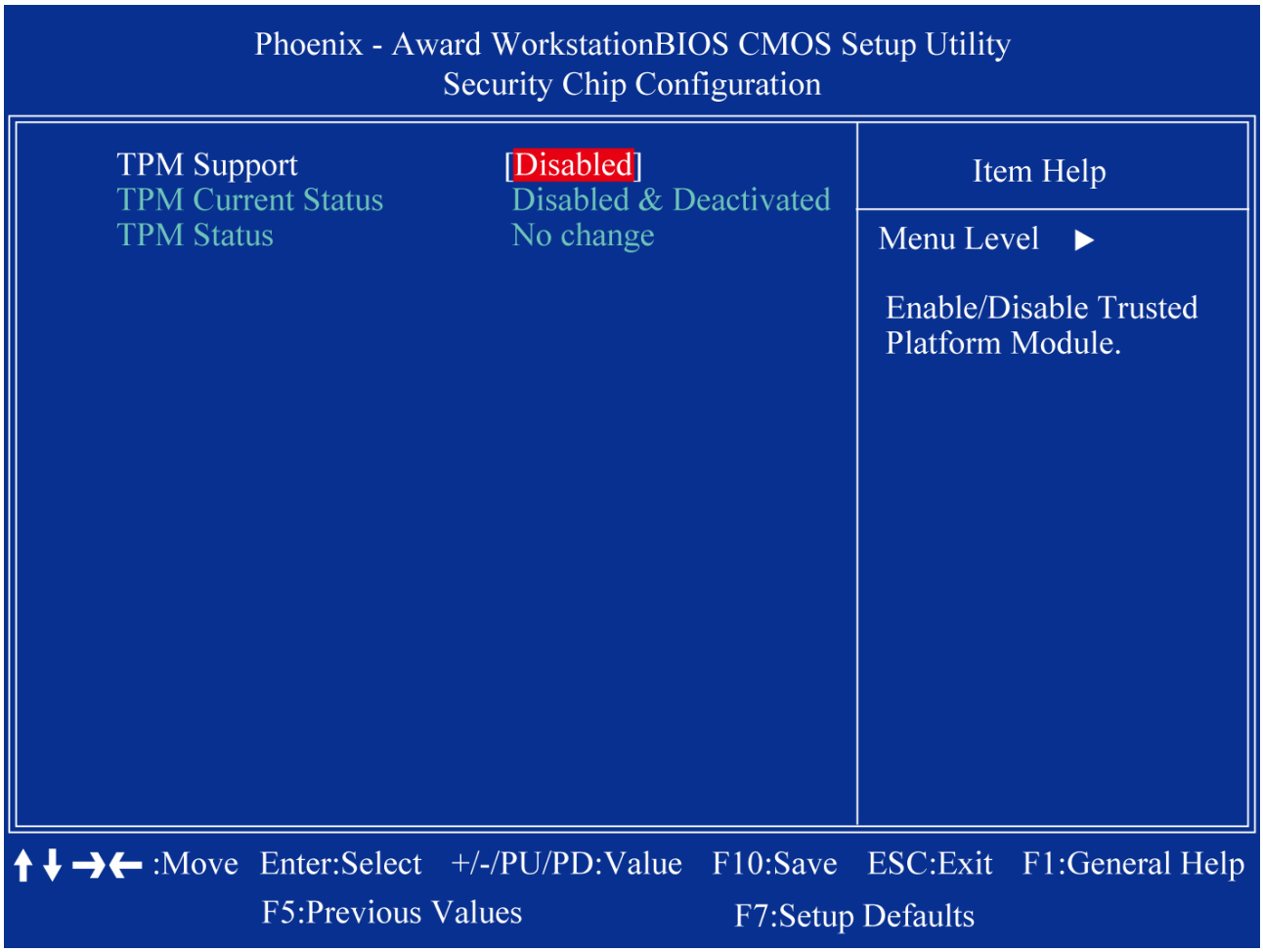
2.3.4.7 Serial Port 3/4 Use IRQ

2.3.4.8 USB Device Setting


Phoenix - AwardBIOS CMOS Setup Utility
USB Device Setting
USB 1.0 Controller [Enabled]
USB 2.0 Controller [Enabled]
USB Operation Mode [High Speed]
USB Keyboard Function [Enabled]
USB Mouse Function [Enabled]
USB Storage Function [Enabled]
*** USB Mass Storage Device Boot Setting ***
Item Help
Menu Level ▶
[Enable] or [Disable] Universal Host Controller Interface for Universal Serial Bus.
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

- USB Controller
  This should be enabled if your system has a USB installed on the system board and you want to use it. Even when so equipped, if you add a higher performance controller, you will need to disable this feature
- USB 2.0 Controller
  Enable the USB 2.0 controller
- USB Keyboard Support
  Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.
- USB Mouse Support
  Select an address and corresponding interrupt for the first and second serial ports

2.3.5 Security Chip Configuration



2.3.5.1 TPM Support

The choices are “Enabled” and “Disabled”.

2.3.5.2 TPM Current Status

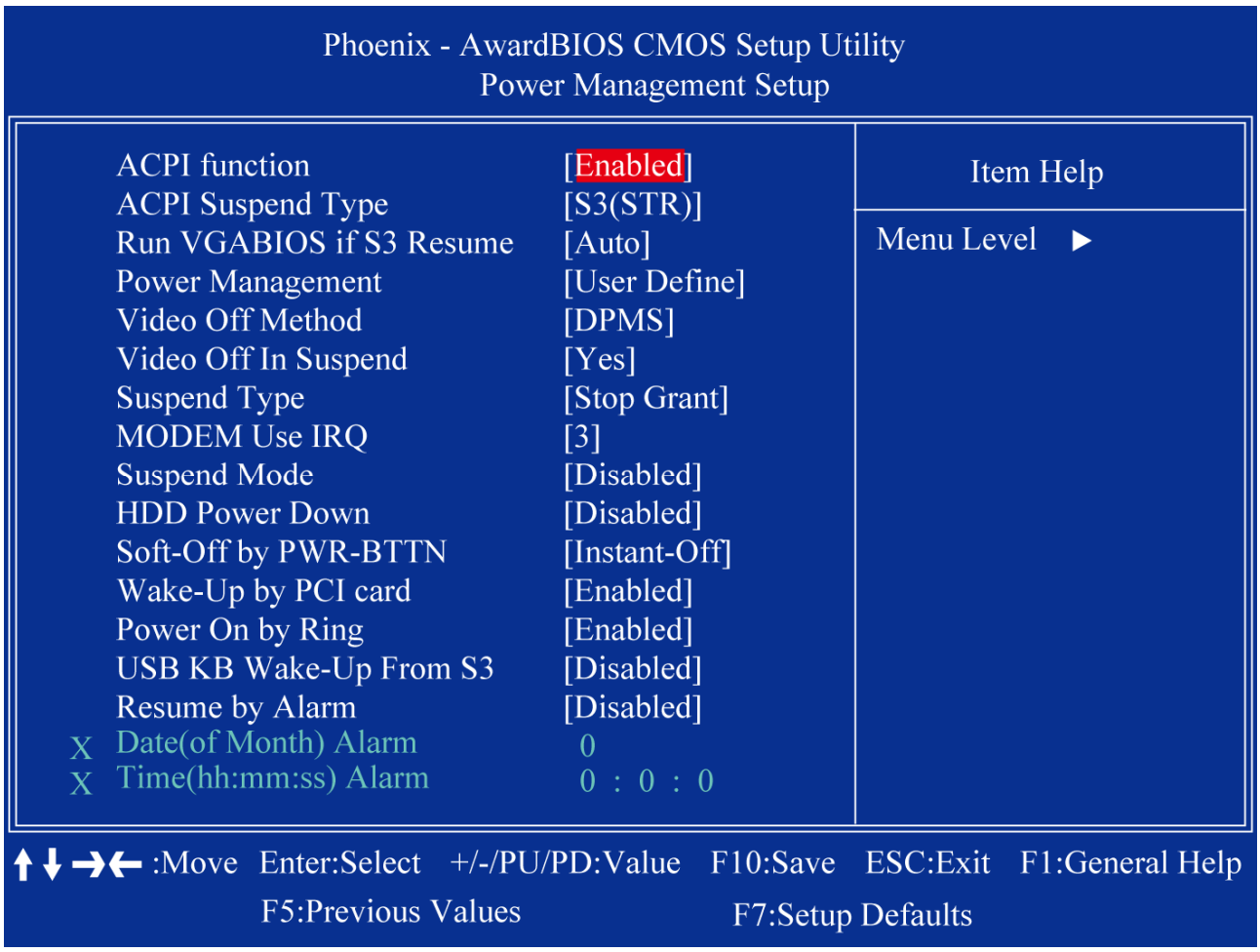
This item shows you the current TPM status.

2.3.5.3 TPM Status

The choices are “No Change” / “Clear” / “Enable & Activate” / “Deactivate & Disable”.

2.3.6 Power Management Setup

The power management setup controls the single board computer's "green" features to save power. The following screen shows the manufacturer's defaults.


Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup
ACPI function [Enabled]
ACPI Suspend Type [S3(STR)]
Run VGABIOS if S3 Resume [Auto]
Power Management [User Define]
Video Off Method [DPMS]
Video Off In Suspend [Yes]
Suspend Type [Stop Grant]
MODEM Use IRQ [3]
Suspend Mode [Disabled]
HDD Power Down [Disabled]
Soft-Off by PWR-BTTN [Instant-Off]
Wake-Up by PCI card [Enabled]
Power On by Ring [Enabled]
USB KB Wake-Up From S3 [Disabled]
Resume by Alarm [Disabled]
X Date(of Month) Alarm 0
X Time(hh:mm:ss) Alarm 0 : 0 : 0
Item Help
Menu Level ▶
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

2.3.6.1 ACPI Function

The choices are "Enabled" and "Disabled".

2.3.6.2 ACPI Suspend Type

This item allows you to set ACPI suspend type to S1/POS(Power On Suspend) or S3/STR(Suspend To RAM).

2.3.5.4 Run VGABIOS if S3 Resume

Select "Auto" to run VGA BIOS if S3 resume automatically. The "Yes" enables running VGA BIOS if S3 resume. The "No" disables this function.

2.3.5.5 Power Management

There are three selections for Power Management, and each of them has fixed mode settings.

Item	Description
Min. Power Saving	Minimum power management, HDD Power Down = 15 Min

Max. Power Saving	Maximum power management, HDD Power Down =1 Min
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

2.3.5.6 Video Off Method

Use this to select the method to turn off the video. The choices are “Blank Screen”, “V/H SYNC+ Blank”, and “DPMS”.

2.3.5.7 Video Off In Suspend

When the system is in suspend mode, the video will turn off. The choices are “No” and “Yes”.

2.3.5.8 Suspend Mode

Item	Description
Min. Power Saving	Minimum power management, HDD Power Down = 15 Min
Max. Power Saving	Maximum power management, HDD Power Down =1 Min
User Defined	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min. and disable.

2.3.5.9 Soft-Off by PWR-BTTN

If you choose “Instant-Off”, then pushing the ATX soft power switch but- ton once will switch the system to “system off” power mode. You can choose “Delay 4 sec”. If you do, then pushing the button for more than 4 seconds will turn off the system, whereas pushing the button momentarily (for less than 4 seconds) will switch the system to “suspend” mode.

2.3.5.10 Wake-up by PCI Card

The choices are “Enabled” and “Disabled”.

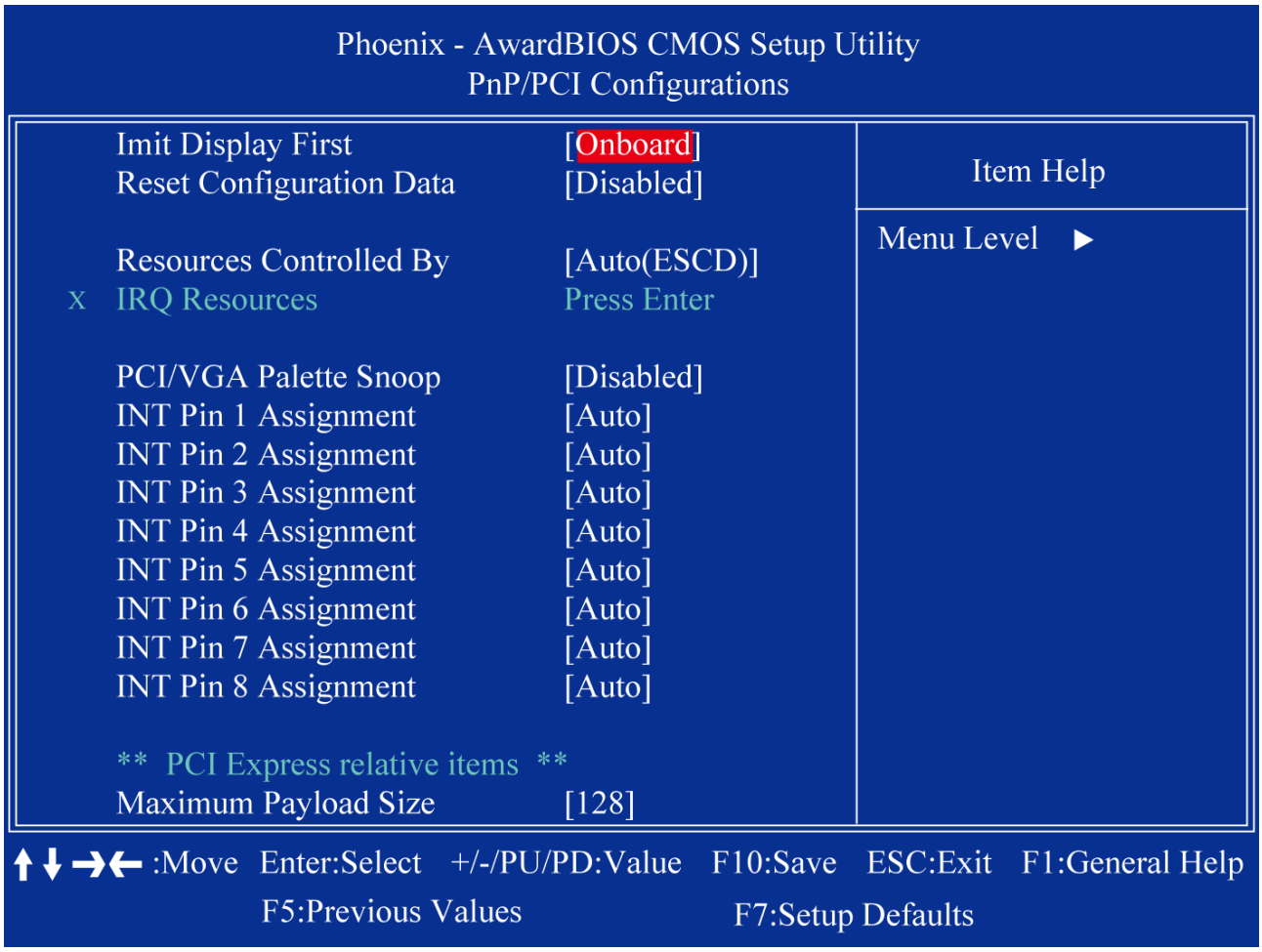
2.3.5.11 Power On by Ring

2.3.5.12 USB KB Wake-up From S3

2.3.6.3 Resume by Alarm

When *Enabled,* your can set the date and time at which the RTC (real-time clock) alarm awakens the system from Suspend mode.

2.3.7 PnP/PCI Configurations


Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Imit Display First [Onboard]
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
INT Pin 1 Assignment [Auto]
INT Pin 2 Assignment [Auto]
INT Pin 3 Assignment [Auto]
INT Pin 4 Assignment [Auto]
INT Pin 5 Assignment [Auto]
INT Pin 6 Assignment [Auto]
INT Pin 7 Assignment [Auto]
INT Pin 8 Assignment [Auto]
** PCI Express relative items **
Maximum Payload Size [128]
Item Help
Menu Level ▶
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

2.3.6.1 Imit Display First

2.3.6.2 Reset Configuration Data

The default is "Disabled". Select Enabled to reset Extended System Configuration Data (ESCD) if you have installed a new add-on card, and system configuration is in such a state that the OS cannot boot.

2.3.6.3 Resources Controlled By

The commands here are "Auto(ESCD)" or "Manual". Choosing "Manual" requires you to choose resources from the following sub-menu. "Auto(ESCD)" automatically configures all of the boot and Plug and Play devices, but you must be using Windows 95 or above.

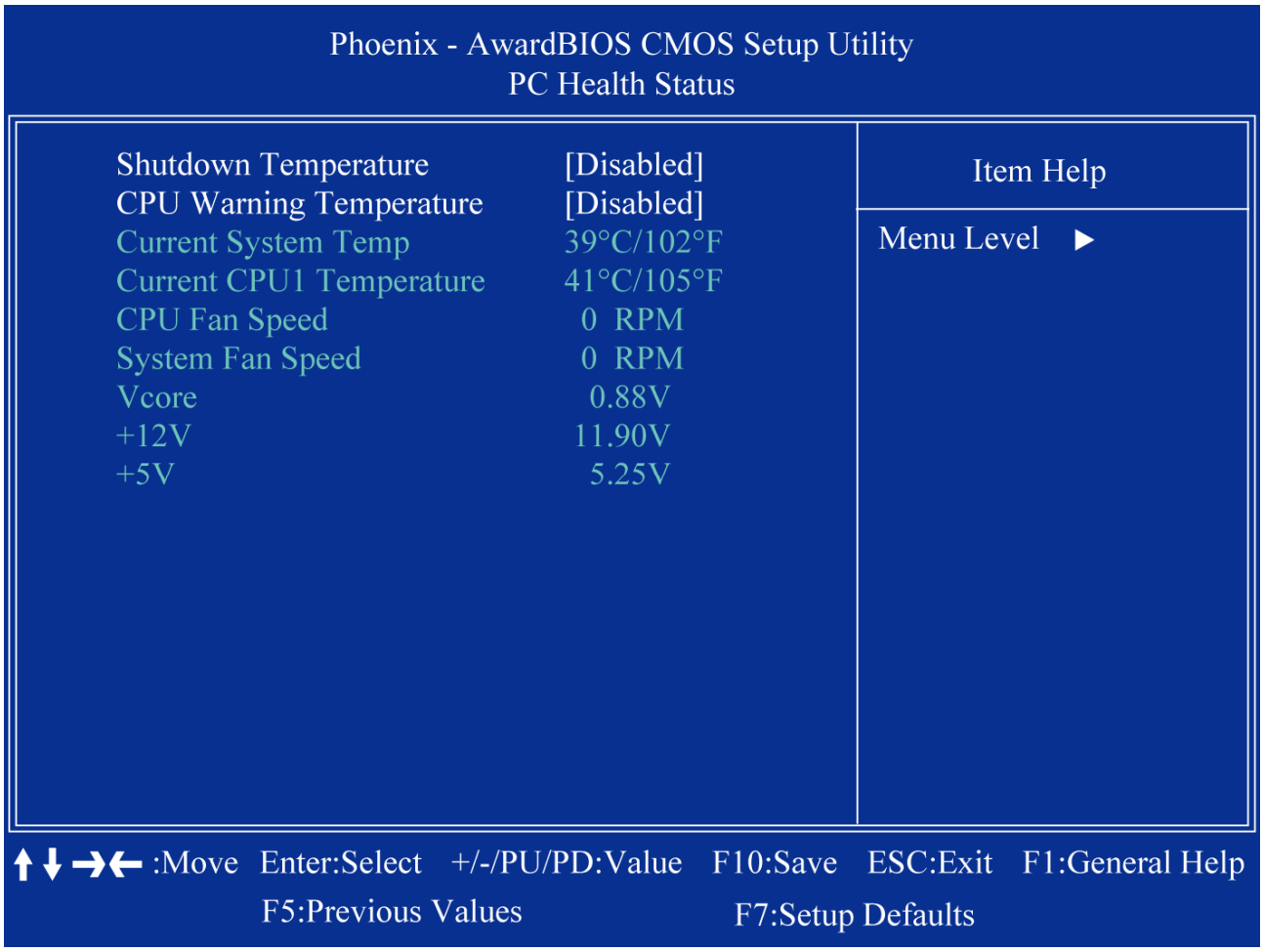
2.3.6.4 PCI/VGA Palette Snoop

This is set to "Disabled" by default.

2.3.6.5 Maximum Payload Size

This allows you to set the maximum TLP payload size for PCI Express devices. The options are [128 bytes], [256 bytes], [512 bytes], [1024 bytes], [2048 bytes], and [4096 bytes].

2.3.8 PC Health Status



2.3.8.1 Shutdown Temperature

2.3.8.2 CPU Warning Temperature

2.3.8.3 Current SYSTEM Temperature

This item shows you the current system temperature.

2.3.8.4 Current CPU1 Temperature

This item shows you the current CPU temperature.

2.3.8.5 CPU Fan Speed

This item shows you the current CPU fan speed.

2.3.8.6 System Fan Speed

This item shows you the current system fan speed.

2.3.8.7 Vcore

This item shows you the current Vcore voltage value.

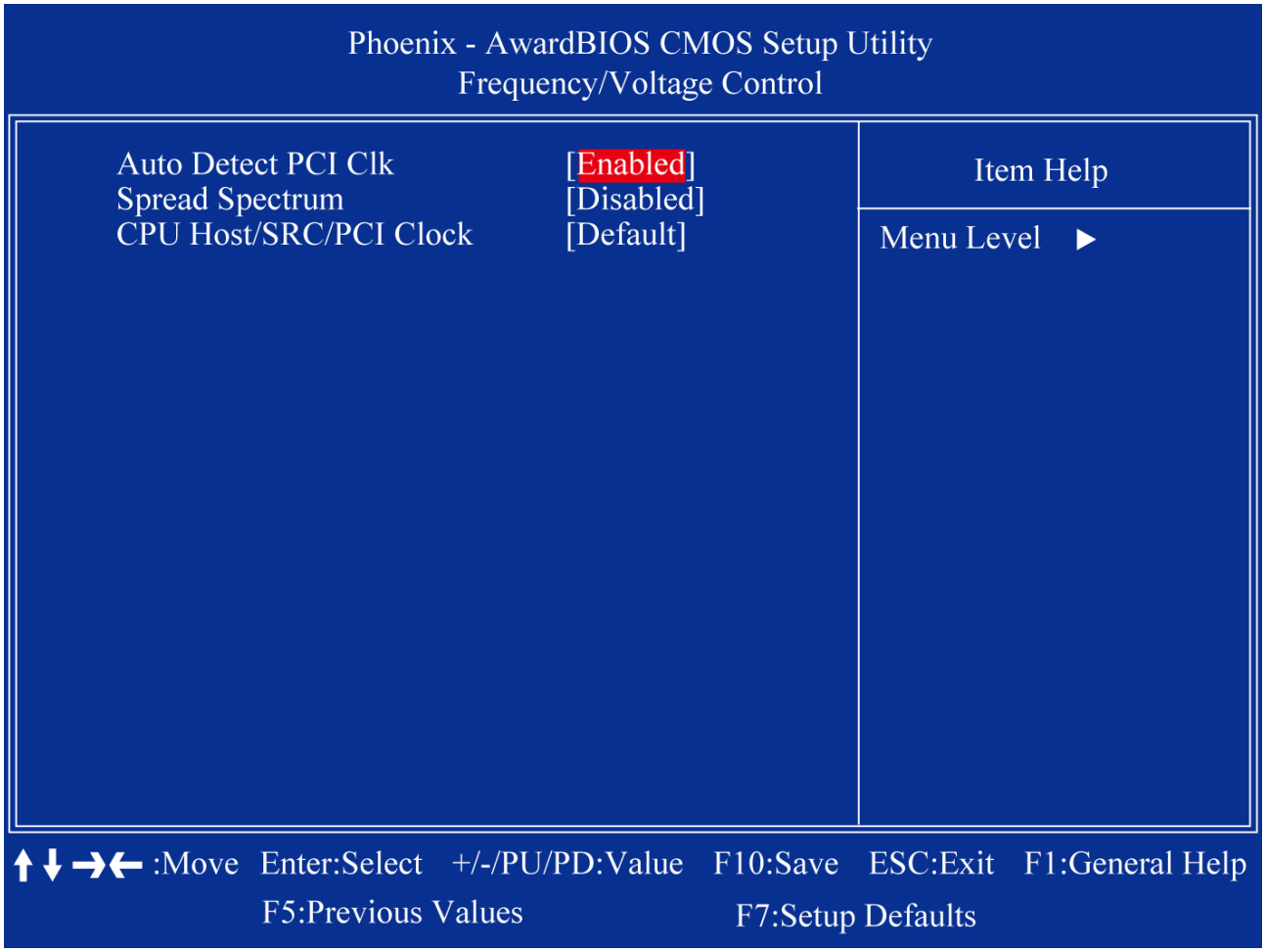
2.3.8.8 +12V

This item shows you the current +12V voltage value.

2.3.8.9 +5V

This item shows you the current +5V voltage value.

2.3.9 Frequency/Voltage Control


Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control
Auto Detect PCI Clk [Enabled]
Spread Spectrum [Disabled]
CPU Host/SRC/PCI Clock [Default]
Item Help
Menu Level ▶
:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help
F5:Previous Values F7:Setup Defaults

2.3.8.1 Auto Detect PCI Clk

This allows you to enable or disable auto detect PCI clock. The choices are "Enabled" and "Disabled".

2.3.8.2 Spread Spectrum

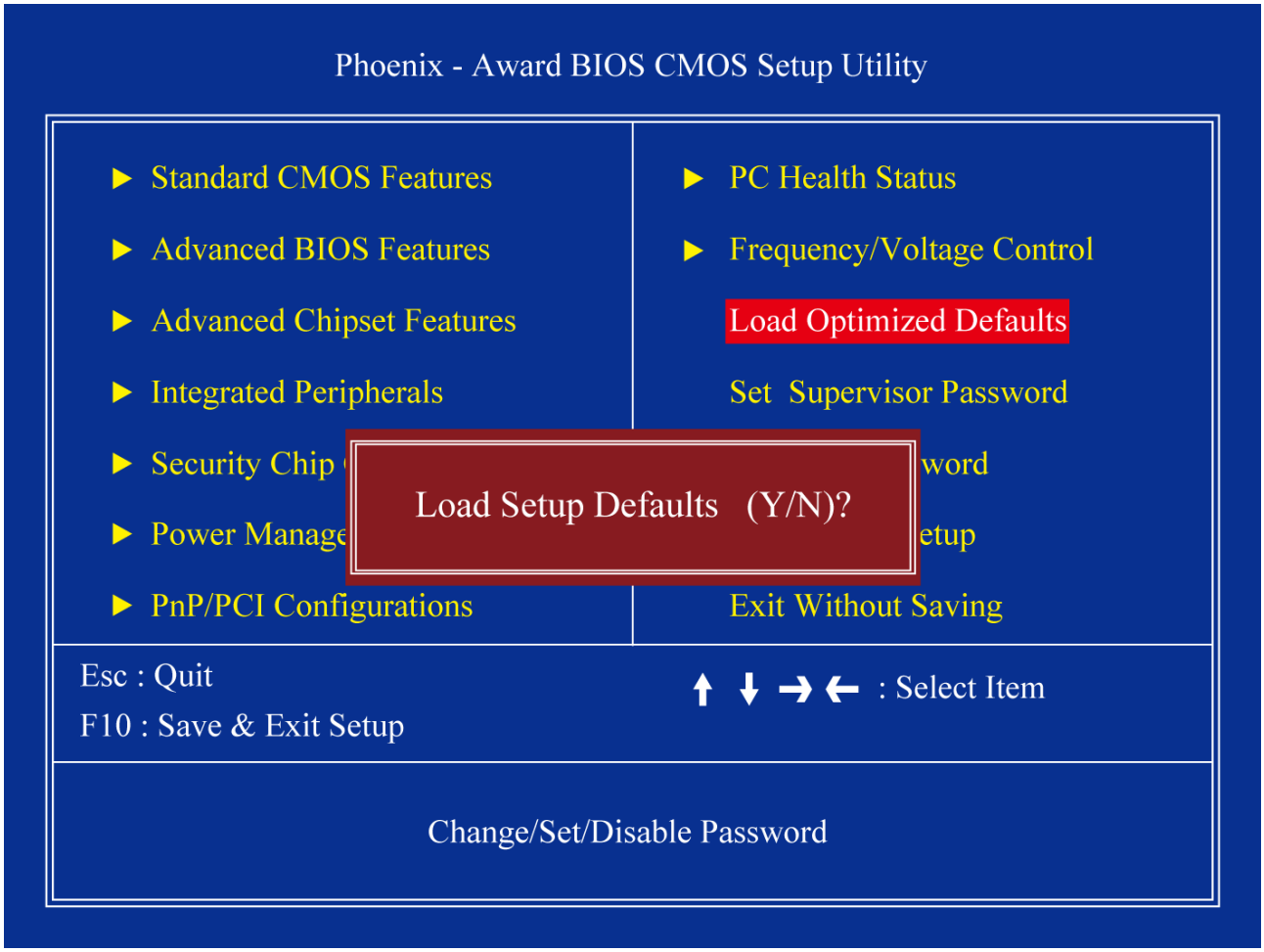
This setting allows you to reduce EMI by modulating the signals the CPU generates so that the spikes are reduced to flatter curves. This is achieved by varying the frequency slightly so that the signal does not use any particular frequency for more than a moment. The choices are "Disabled" and "Enabled".

2.3.8.3 CPU/Host/SRC/PCI Clock

The choice: 100

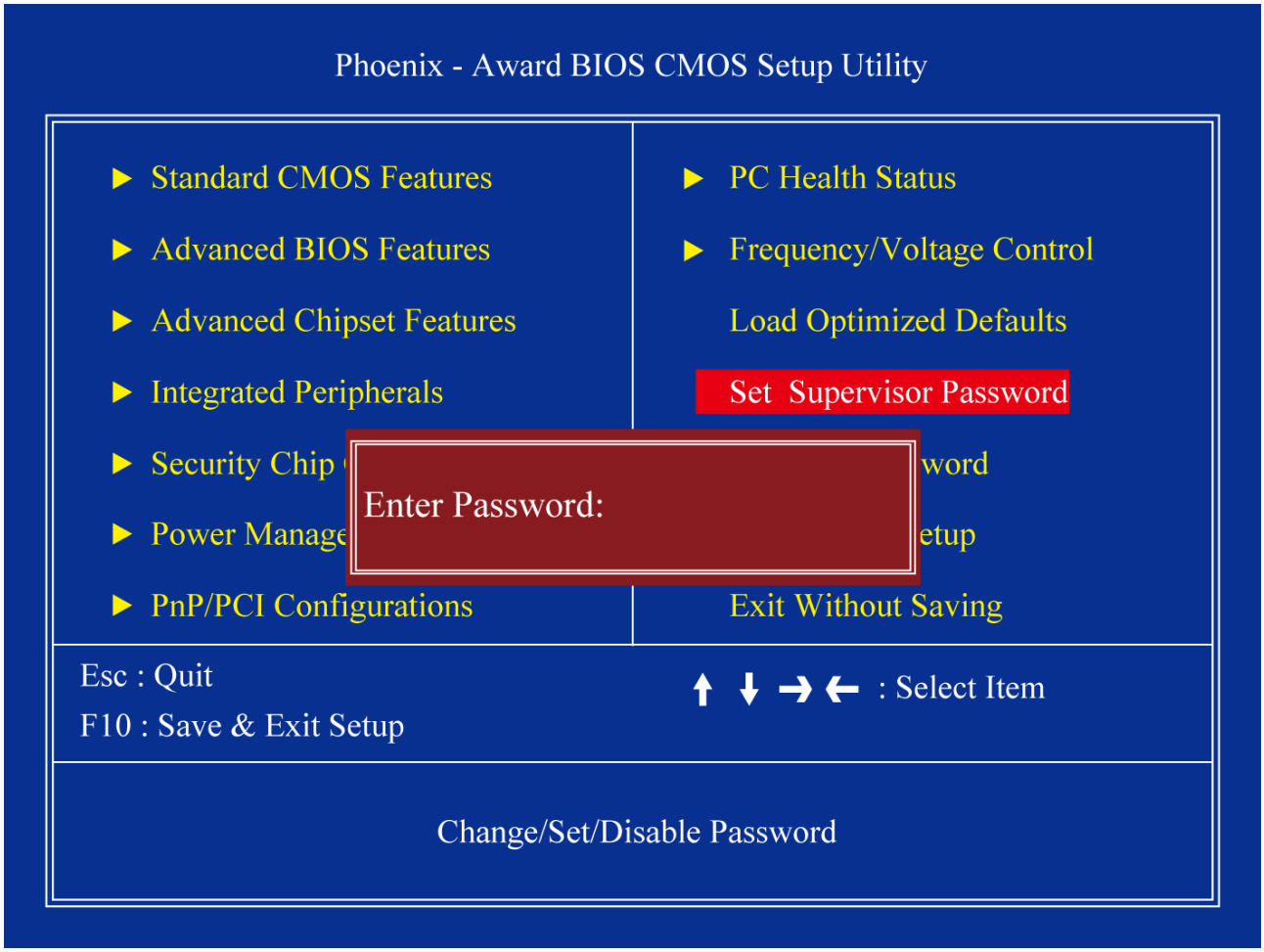
2.3.10 Load Optimized Defaults

Use this menu to load the BIOS default values for the minimal/stable performance for your system to operate. Press <Y> to load the BIOS default values for the most stable, minimal-performance system operations.



2.3.11 Set Supervisor Password

You can set password to be able to enter/change the options of setup menus.



Follow these steps to change the password.

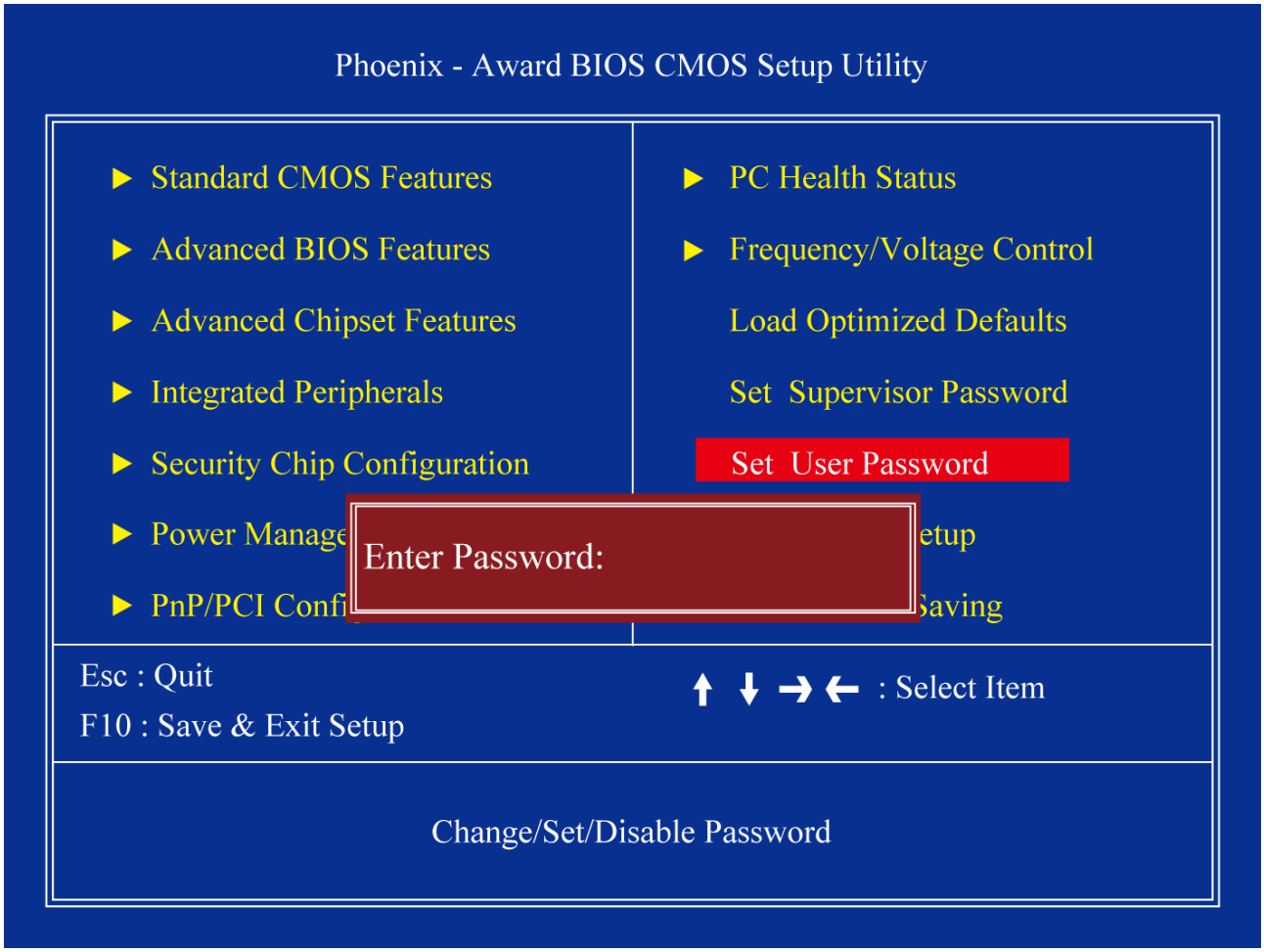
- Choose the "Set Password" option from the "Initial Setup Screen" menu and press <Enter>. The screen displays the following message:
- Please Enter Your Password
- Press <Enter>.
- If the CMOS is good and this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen displays the following message:

Please Confirm Your Password

- Type the current password and press <Enter>.
- After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters. Remember, to enable the password setting feature, you must first select either "Setup" or "System" from the "Advanced BIOS Features" menu.

2.3.12 Set User Password

You can set password to be able to enter/change the options of setup menus.



Follow these steps to change the password.

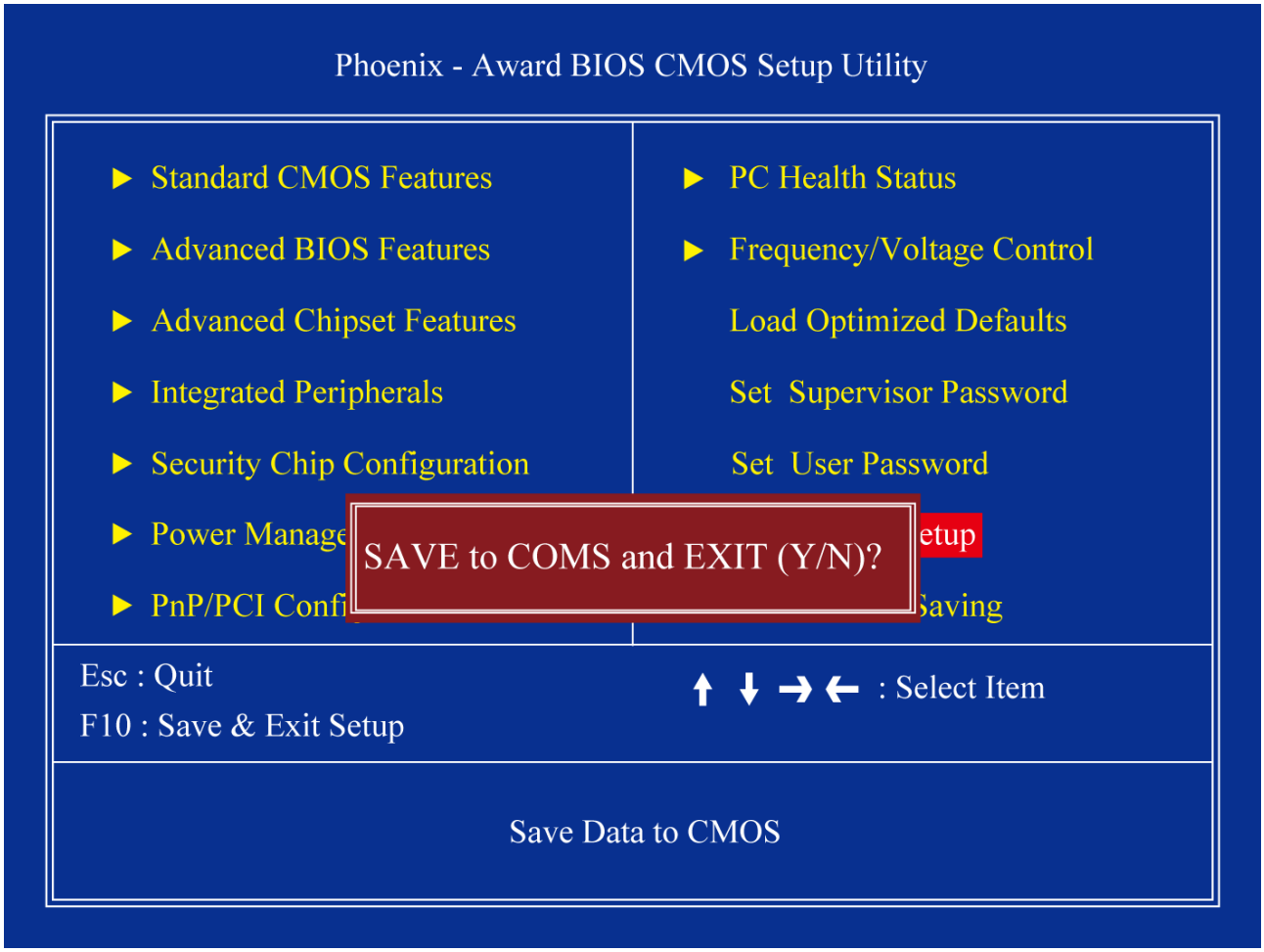
- Choose the “Set Password” option from the “Initial Setup Screen” menu and press <Enter>. The screen displays the following message:
- Please Enter Your Password
- Press <Enter>.
- If the CMOS is good and this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen displays the following message:

Please Confirm Your Password

- Type the current password and press <Enter>.
- After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters. Remember, to enable the password setting feature, you must first select either “Setup” or “System” from the “Advanced BIOS Features” menu.

2.3.13 Save & Exit Setup

If you select this and press <Enter>, the values entered in the setup utili- ties will be recorded in the CMOS memory of the chipset. The processor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the sys- tem to operate.



2.3.14 Exit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.